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International Paper Wins Mulch Paper Suit

Company Sustained By U. S. Circuit Court of Appeals In Its Suit Against Graham Paper Co. For Infringement of Eckart Patents—Accounting of Damages and Profits Further Ordered By Court—Protected By Comprehensive Court Decision, International Plans Even More Aggressive Sales Campaign For This Year's Planting Season

The United States Circuit Court of Appeals for the Eighth Circuit recently rendered a decision sustaining International Paper Company in its suit against Graham Paper Company for infringement of Eckart mulch paper patent No. 1,377,566 and reissue patent No. 15,231. Under the court's decision, the latter company is enjoined from infringing the patent or any of its claims; from selling or offering for sale any paper designated as mulch paper or mulching paper—or word or words of similar import; or from advertising or holding out as such paper, any paper which is adapted for use in accordance with the method covered by the patent. The court further ordered an accounting of damages and profits.

Both Patents Held Valid

The lower court last year held that International Paper Company's mulch paper patent—No. 1,377,566, issued May 10, 1921—was valid and has been infringed by Graham Paper Company, but that International Paper Company's reissue patent No. 15,231 has not been infringed. The Court of Appeals now affirms the decision of the District Court as to the first patent and reverses the decision on the second patent, holding both International Paper Company's patents valid and infringed by Graham Paper Company.

Patent Involved Actual Invention

The Court, after explaining the function of mulch paper and relating the story of its invention by Mr. Eckart said: "We are satisfied there was real merit in patent No. 1,377,566, and that it involved actual invention, and substantially advanced the art. Mulch or mulching is a common and well-understood term, long in use. The term 'Mulch Paper' was not in such use prior to Eckart's invention. He is entitled to the credit for the original method of using mulch paper to assist in plant growth."

Plans Sales Campaign

With the protection of such a comprehensive court decision International Paper Company is now planning an even more aggressive sales campaign on mulch paper for this year's planting season. The Company has wholesale distributors in principal cities east of Colorado, and through them "Gator Hide Mulch Paper" is distributed to retail hardware, seed, implement and other stores throughout the country.

Ask Receiver for Willapa Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 14, 1931.—Receivership for the Willapa Pulp and Paper Mills, an Oregon corporation organized September 27, 1927, has been asked through a suit filed in circuit in Portland March 13 by P. K. Mayers and V. K. Sturges, stockholders.

The company was organized to build a huge pulp mill on Wallapa harbor in Pacific county, Wash., but the stockholders state that the mill has not been constructed and that the funds have been dissipated.

The bill asks that William D. Bennett, Portland, be named as receiver of all books, records and properties of the corporation, as well as $14,900 on deposit at the United States National bank, Portland, which is declared to be the balance remaining of the money raised through stock selling which at one time was reported to be $700,000.

Piling was driven on the site and is now rotting and property owned by the corporation is becoming valueless, even being exposed to fire hazard, according to the bill.

The corporation owns 2,000,000 feet of timber valued at $120,000 in Pacific county, booming grounds, waterfront property, docks, lime deposits and supplies valued at $1,000,000 according to the complaint. Officers and directors failed to pay taxes for 1929 and 1930 totaling $6000 in Pacific county the bill states.

It is also alleged in the complaint that the corporation lent $94,000 to the British-American Mines and Smelters corporation which has not been repaid. Security for this loan is practically worthless, the complaint states. The action, which was filed by McCamant, Thompson & King, attorneys, also asks that $2000 be set aside for attorney fees.

Votes To Exempt Deerfield Glassine Co.

[FROM OUR REGULAR CORRESPONDENT]

MONROE BRIDGE, Mass., March 14, 1931.—The town voted at their town meeting recently to exempt from taxation the Deerfield Glassine Company for the year 1931. This will be done if the state commissioner on taxation consents. Representatives of the company explained to the voters that the concern had been losing money and was cutting down every possible expense to try to maintain operations.

Kimberly-Clark Corp. Finances Improvements

Bond Issue of $3,500,000, Drawing 5 Per Cent Interest, Placed On Market—Total Authorization Is $20,000,000—Company Has Spent Approximately $5,000,000 During Past Two Years In New Building and Equipment to Modernize Their Mills

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 16, 1931.—Financing of the recent extensive improvements of the Kimberly-Clark Corporation, Neenah, Wis., will be accomplished in part by a bond issue just placed on the market totalling $3,500,000. The company now has its common stock listed on the New York Stock Exchange, and has made application to list the bonds there also. During the last two years the company has been modernizing its mills and has spent approximately $5,000,000 in buildings and equipment. Total authorization is $20,000,000, and when this new block is sold, there will be outstanding $9,250,000. The bonds are dated July 1, 1928 and will mature July 1, 1943. They draw five per cent interest.

Production of Paper Increased

It is pointed out in the company's statement the earnings are 8.7 times the interest requirements and the equity junior to these bonds is approximately $30,000,000. Production of paper was increased to 147,000 tons in 1930 and the amount of developed water power was also increased. More than fifty national magazines are now receiving their paper from the mills of this company, and 90 per cent of the rotogravure paper used in the country is produced here. Capitalization, including the current bond offering, will amount to $9,250,000 in series A 5 per cent bonds, $10,000,000 in 6 per cent cumulative preferred stock, and 499,800 shares of common stock of no par value.

Water Power Appeal Dismissed

An appeal to the United States Supreme Court by the Nekoosa-Edwards Paper Company, Port Edwards, Wis., attacking the validity of the Wisconsin recapture clause in the water power act has been declared to be outside the jurisdiction of the court and the case will be dismissed. The comapny built a dam costing $450,000 on Four Mile creek to impound Nepco Lake, from which the company pumps 500,000 gallons of water daily for its mills at Port Edwards and Nekoosa. No permit was obtained from the Wisconsin Railroad Commission because the company did not wish to submit to the recapture law, which would permit the state or a local municipality to condemn and purchase the improvement at the end of thirty years. It was shown that if the court decided against the company, it would be necessary to remove the dam at a cost of $700,000, including the damage to property which would thus be destroyed.

The company took an appeal to the Wisconsin Supreme Court upon an order of the Wisconsin Railroad Commission which imposed conditions under which the company could pipe water from the lake. The court ruled that the stream was navigable but the only evidence to support the contention was the use of the stream in previous years to float logs. The dam had been built so logs and row boats could go around it. The company took the stand that it was the owner of the land on Four Mile Creek which would be affected by the dam, that the stream was non-navigable and therefore not within the jurisdiction of the state, and that the dam would not interfere with logging operations. The dam develops no power for use at the mills.

Forest Protection-Board to Meet

As a further means of saving Wisconsin's pulpwood and merchantable timber, the Forest Protection Board of the Lake States Experiment Station will hold a meeting March 31 at the Milwaukee offices to study methods which will control or abolish fires, rodents, insects and other causes of timber destruction. Blister rust threatens to exterminate the white pine if not controlled, and it is pointed out also that insects cause an annual timber loss greater than the ravages of fire. The snow shoe rabbit and the jack rabbit also are a menace, especially among young trees in the forest nurseries. Means of extermination will be adopted. It is believed that the removal of currant and gooseberry bushes from forest areas and a surrounding zone will do away with the disease menace.

Russell B. McKennan, formerly employed at the national forest in Minnesota, has been transferred to Wisconsin to become assistant supervisor of the Wisconsin unit. The government program of road building in the Flambeau Forest unit is under way as a means of affording better fire protection.

Marinette & Menominee Appeal Dismisses

Payment of thousands of dollars to riparian owners whose lands were claimed to have been damaged by construction of a dam by the Marinette and Menominee Paper Company, of Marinette, is a possibility facing the company as the result of dismissal by the Wisconsin Supreme Court of an appeal from a desicion of the lower courts. The land owners contended that the paper company, when it built the Park Dam in 1922, raised the level tow feet without authorzation of the Wisconsin Railroad Commission. The company obtained this permit about two years ago. The plaintiffs contended that the addition of two feet to the dam interfered with natural drainage of adjacent lands by raising the water level, causing much of the land to become sour and worthless for agriculture. Damages of $1,000 were awarded to Theodore Manns, and the decision caused the filing of thirty other suits. The paper company and its subsidiary, the Union Falls Power Company contested the litigation throughout.

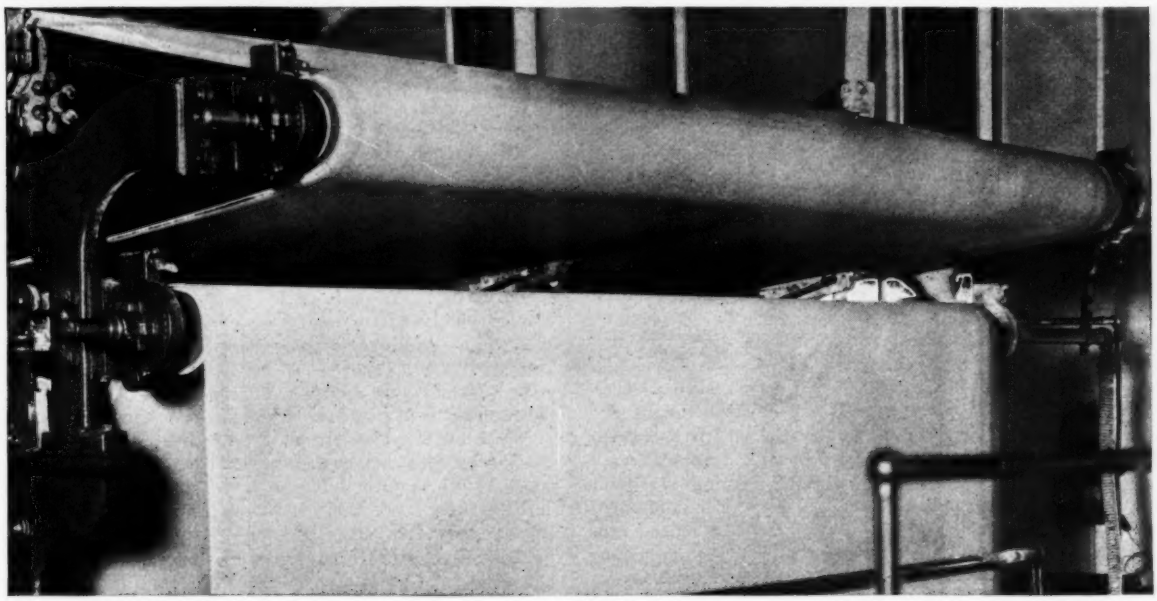
News of the Industry

The closing banquet of the safety school conducted at Green Bay, Wis., was held last week with an attendance of 500. J. M. Conway, president of the Hoberg Paper and Fibre Company, acted as toastmaster, and a chorus made up of employees of this mill furnished music. Enrollment in the school was greater than in any school conducted during the last four years. Paper companies whose employees attended were the Hoberg Paper and Fibre Company, Bay West Paper Company, Fort Howard Paper Company, Northern Paper Mills, and Straubel Paper Company. The principal speaker was J. H. Hudson, of Chicago, who gave an inspirational and humorous address emphasizing the value of continuous safety effort.

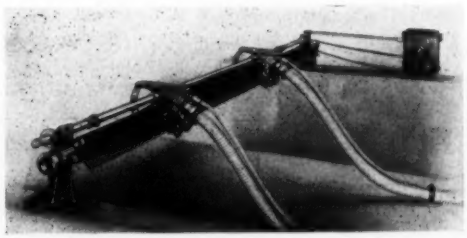
Members of the Lake States Section of the Technical Association of the Pulp and Paper Industry held a dinner last week at Menasha, Wis. The speakers and their subjects were: C. C. Bleil, of the E. I. Du Pont de Nemours Company, "Mill Paints," and O. W. Calligan, of Edgar Brothers Company, "Clay for Coating and Filling." A discussion was held afterward on each address.

A collection of commercial dyes valued at $2,500 has been given to the Institute of Paper Chemistry at Lawrence College, Appleton, Wis., by the Calco Chemical Company, of Bound Brook, N. J. The company also provided a cabinet in which to display the collection. The collection was accompanied by a huge collection of dyes to be used in experimental work.

A Vickery Felt Conditioner at work on a press felt.



Your felts can be like new— ALL THE TIME



VICKERY FELT CONDITIONER

With Vickery Felt Conditioners at work on your press sections, you get *continuously* the kind of felt performance you expect only from a *new* felt. You get rapid water removal, uniform across the entire sheet. You get complete freedom from felt marks. *And you never have to shut down for washing and roping.*

Our trial installation plan allows you to test out a Vickery Felt Conditioner at our expense. Write for details.

BIRD MACHINE COMPANY ◆ SOUTH WALPOLE, MASSACHUSETTS

Ontario Paper Mills Are Moderately Active

Manufacturers Report Orders On Most Grades Well Up to Machines, With Comparatively Few Orders Ahead—Wholesale Paper Distributors Experience Broadening Demand For Higher Grades of Fine Papers—Abitibi Company Earns 47 Cents Per Share

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, March 16, 1931.—A feature of the wholesale paper trade during the past week or ten days was the broadening out of the demand for fine papers to cover the better class stock. Hitherto purchasers of fine papers have been confining their attention to the cheaper grades but there are frequent enquiries and sales now of the higher grades. There has been an increasing demand for rag and paper stock by the board mills chiefly, and with collections none too good, dealers have been unable to fill orders. Board mills have been quite busy of late and on the whole are averaging five days a week operations, notwithstanding the fact that the paper box industry is still rather quiet. There is a slightly better call for paper bags and wrapping and the kraft trade is picking up a bit, although it is nothing like it should be. Light weight paper wholesalers and manufacturers report a steady business and there is a much better call for glassine, waxing and grease proof lines. While in most lines the mill trade is fairly active, the fact remains that orders are well up to the machines but there are comparatively few orders ahead of them.

The paper converting trade is still quiet and there is little activity among envelope, blank book and general stationery manufacturers.

Abitibi's Report Shows Increased Assets

For the year ended on December 31, 1930, the financial statement of the Abitibi Power and Paper Company shows after all charges, including interest, full allowance for depreciation and depletion and preferred dividends, a balance of $513,836 available for the 1,088,117 shares of common stock outstanding, or 47 cents a share. As no dividends were paid on the common, this amount was carried forward to profit and loss.

Operating profits for the year amounted to $7,374,337, compared with $8,377,246 in 1929, a decline of approximately 12 per cent. After interest at $2,786,070 and depreciation and depletion at $1,666,523, there remained a net profit of $2,921,744. Preferred dividends for the year, including those paid on Provincial Paper, amounted to $2,407,208, and left a balance of $513,836 available for the common stock. This compares with a balance of $1,949,697 after preferred dividends in 1929. Previous surplus was brought forward at $61,595,530, making a total of $62,109,366. From the accumulated surplus a sum of $500,000 was transferred to investment reserve, leaving a profit and loss balance in the current report of $61,609,366.

The report of the directors refers to the acquisition of all the common shares of Provincial Paper, and to the consolidation of the accounts of the parent company, and says there was reflected in the balance sheet an increase in fixed assets of $8,819,528, to which must be added $1,334,434 expended on capital additions during the year, a total increase in fixed assets of $10,153,962.

The balance sheet reveals an increase in total assets, which stand at $193,409,283, against $177,921,713 at the end of 1929. The effect of the consolidation of items in the balance sheet to include Provincial Paper is shown in the report. Net working capital is shown at $15,086,005, against $13,071,726 at the end of the preceding year, a gain of more than $2,000,000.

Paper Mills Well Supplied With Wood

W. H. Russell, head of the Russell Lumber Company, Ltd., Port Arthur, Ont., who was recently elected president of the Canadian Pulpwood Association, says that he feels the organization has already accomplished considerable work of a constructive character and that it has open to it many avenues of service for the future. He has made definite enquiry with reference to the amount of pulpwood being taken out at the Head of the Lakes this season and as to how its output will compare with that of last year. This inquiry reveals the fact that the current total production of pulpwood in the Thunder Bay district will be about 27 per cent. of that of 1930. These figures include both domestic and export wood and also spruce, balsam, and poplar species. The export production (the figures of which are included in the above estimate) runs about 60 per cent. of 1930, leaving the current domestic production only about 11 per cent. of last year.

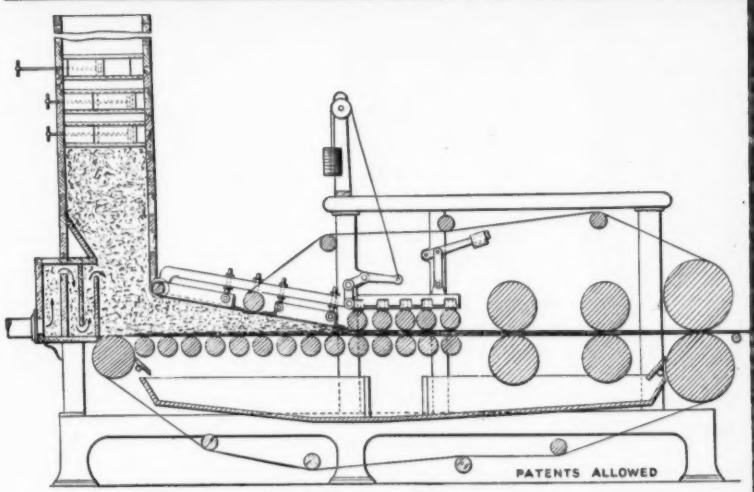
With regard to condition of stocks on hand it is reported that all of the domestic mills have large stocks in yards; the only plant the piles of which are being reduced at all noticeably being the West Fort William (Great Lakes Paper Company) plant of the Backus-Brooks interests. The Thunder Bay Paper Company (Abitibi) are shut down completely, and Provincial Paper, (Abitibi) is only operating part time. Most of the American mills which draw any export wood from the Thunder Bay district have large inventories of wood so that no improvement in the demand is expected this Spring. "With reported improving business by next Fall there should be some measure of return to normalcy in the trade," said Mr. Russell, who added that his own company was not operating in the woods at all this season, believing in curtailed production under the circumstances.

Freight Rates High Says Pulpwood Man

Swan Swanson, of Dryden, Ont., who usually takes out about 5,000 cords of pulpwood besides several thousand ties, is not operating this season. In an interview he stated that there were no prices for pulpwood whatever. The pulp mill at Dryden, which uses only jack pine, has sufficient wood in stock, as near as can be judged, to last a couple of years, as the plant is only running half time. The pulp mills at Kenora and also at the Head of the Lakes are also overstocked with wood and the American market is almost closed to Canadian operators on account of the high freight rates that are charged by the railways on pulpwood going in the United States. "I presume it is not generally known that we have the preposterous situation on the railways being allowed to charge two different freights on pulpwood," said Mr. Swanson. "That is to say if we ship pulpwood to an American firm at the head of the lakes, the freight would be approximately from our shipping point $2.00 a cord more if consigned to an American firm than if it is consigned to a Canadian firm. Why this should be is absolutely beyond our understanding. Of course this high freight rate levy on American shipments does not concern the shippers who have their pulpwood anywhere on the Lake Superior water-shed as they simply run the wood down the rivers into Lake Superior. It is then loaded on the boats and the railroads get no benefit from it and therefore, cannot charge the extra freight rate.

"If this freight rate was changed into one schedule only we might be able to share in the American market which, at present, on account of the freight rate charge, is just about closed to us."

Purposely Designed for Continuous Board Forming



The Downingtown Board Forming Machine is not an adaptation or modification of any conventional machine in the pulp and paper industry. It is a new type machine, radically different, designed to meet the requirements of this new industry. It will make up to 300,000 square feet of ½" board in 24 hours and proportional amounts of boards of various thicknesses up to 1½". Saw mill waste, bagasse, licorice root, mineral wool from blast furnaces and other materials of a fibrous nature can be turned into a saleable product. Our commercial laboratory will make sample board from your waste material.

Downingtown Manufacturing Company

Downingtown, Pa.

Chicago Paper Market Conditions Unchanged

Better Grades of Fine Papers Continue to Exhibit Strong Undertone—Book and Cover Papers Rather Spotty At Present—Efforts Being Made to Stabilize Kraft Paper Division—Paper Board Manufacturers Still Curtailing Output

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 14, 1931.—The paper trade continues to remain practically unchanged from week to week as Spring comes on. Here and there reports indicate that paper merchants and manufacturers are putting up a more bold front, showing a marked unwillingness to tamper with prices and a desire to do more constructive building up. It is true that prices are about as low as they can get but the desire of most representatives to maintain prices is taken as a sign that better days are coming in the near future.

Fine Papers Make Progress

The better grades in the fine papers are continuing to make progress although some slowing up is noted as buyers watch first quarter developments. In the kraft market it is indicated that it is now time for a building up process to take place and Chicago jobbers themselves are making an effort to stabilize this market. Within the last sixty days orders have picked up and pleasing activity resulted. The board representatives report that mills are continuing their effort to curtail production. Prices have become more stable with this effort and a turn in business would probably be felt immediately, say reports. Books and covers remain about as last week with the market presenting a somewhat spotty condition. The waste paper market tends to follow the market in general, with the better grades of waste following the improved trend of the finer papers.

Paperboard Man to Confer In New York

The Paperboard Industries Association has issued a statement from its offices in Chicago listing the next meetings of the association for the Commodore Hotel, New York City, and the dates March 17, 18 and 19. From the schedule of meetings shown the Folding Box and Paperboard groups will meet on Wednesday, March 18, with the former meeting in the morning and the latter in the afternoon. On Thursday, March 19, the Container Group will meet in the morning and a general meeting of all three groups in joint session will be held in the afternoon, with J. H. Macleod, president of the association, presiding. A luncheon for all members will be held at noon. Committee meetings will be held on March 17 with the Sales Promotion, Statistical, Standardization, Trade Customs and Practices Committees meeting in the forenoon and the Executive Committee in the afternoon.

It has been indicated, from reports, that the coming session of the association will take up at some length a discussion of its part in the nation-wide study to overcome the unemployment problem. Long term planning of operations, a study of new markets, time arrangements, etc., will probably be gone over thoroughly by members of the group. It is known that the association is also forming a committee to work in contact with the Waste Paper Division of the National Waste Material Dealers Association. A large group of Chicago members of the three groups identified with the association are expected to journey to New York City to take part in the program as scheduled above.

George K. Gibson Addresses Paper Salesmen

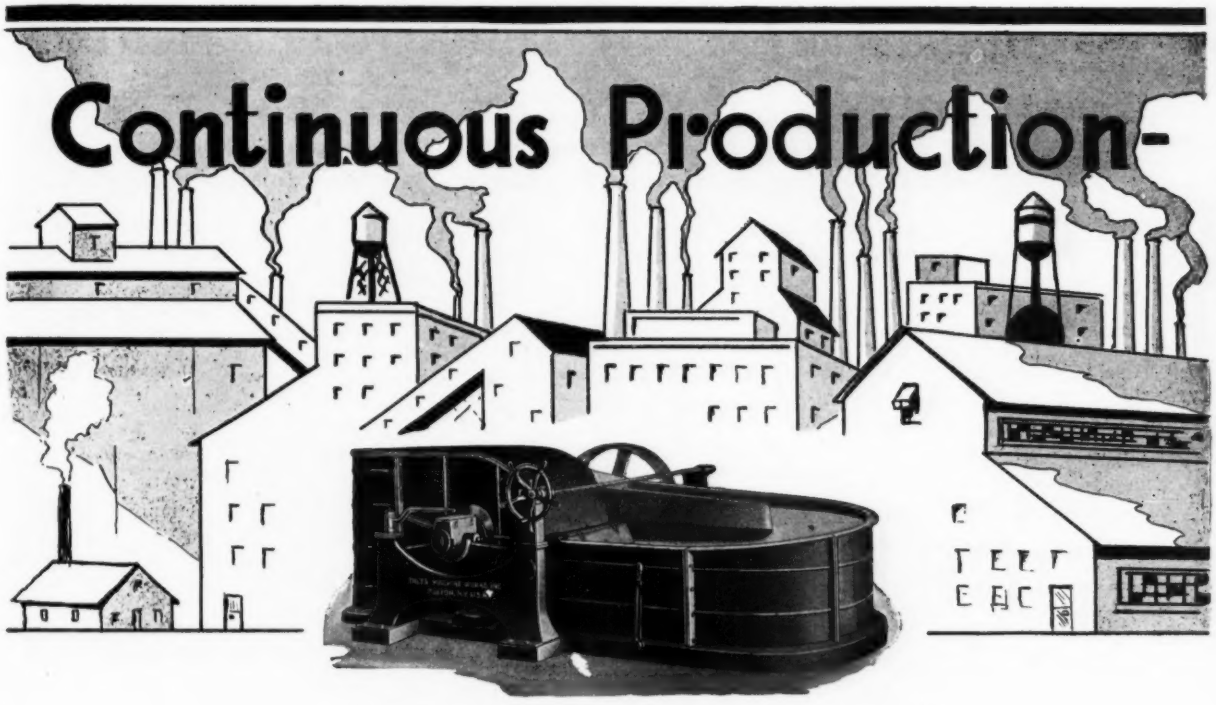
In the absence of John Wesley, sales manager of the Rhinelander Paper Company, who was scheduled to talk at the regular Monday meeting of the Mid-West Division of the Salesmen's Association of the Paper Industry on March 9, George K. Gibson, of Mosinee, pinch hitted very effectively giving a straightforward talk on conditions in the industry today. Mr. Gibson, a statistician and student of business affairs, gave a splendid analysis of what present day conditions and their continuations would mean in the industry. Stressing what competition would cause the mills to do he pointed out that the low cost mill of today would be the high cost mill of tomorrow if things went on as they have been doing in the near past. The mill forced out of business would come back into business with a recognized financial structure that would enable it to get the low cost business and, accordingly, make the present low cost mill the high cost establishment of tomorrow. In this manner, according to Mr. Gibson, we arrive at the fallacy of low cost production and see the wisdom in stabilization and taking of legitimate profits. Mr. Gibson was by no means pessimistic about paper conditions but voiced the hope that executives in the industry would bend their minds toward the problems of today in order to clarify the near future.

Container Corp's. Profits Decline

The Container Corporation of America, over which a proxy fight for control is rapidly coming to a head, issued its 1930 report on March 11. The report said that net profit of $105,167 had been earned last year as compared to $1,205,931 in 1929. During 1930 the report states that the company paid out $586,071 in dividends on the preferred and class A stock, leaving a deficit of $480,904 for the period. Walter P. Paepcke, president, issued the report and it was his policies and those of the executive committee that have been challenged, according to reports, by J. P. Brunt, executive vice president. Mr. Brunt's statement was mailed to stock holders a few days. Mr. Paepcke, in his letter accompanying the report stated that profitable earnings were impossible because of unsatisfactory prices and volume in the last two months of the year. Earnings were fairly satisfactory during the first ten months of the year, said Mr. Paepcke, especially considering general business conditions and, particularly, the "very acute competitive situation in the paper board and container industry". The worst business was faced in the last two months of the year. Expenditures for repairs and maintenance were over $500,000 for the year, Mr. Paepcke pointed out. The annual meeting of the Container Corporation takes place next week and the outcome will be watched with interest.

Chicago Paper Association's Activities

The Chicago Paper Association held its regular meeting on Tuesday evening March 10, at the Bismarck Hotel. The association, as an entity, is trying to work on a re-sale price for three commodities, bags, butcher dry finishes and kraft papers. The depressed condition of the market has caused the organization to work to encourage a re-sale price especially for smaller orders. A round table discussion gave evidence that a big majority of the members were strongly in favor of this activity and the work will be carried on which, it is believed, will benefit the industry here. Wolf & Co., accountants and statisticians, who have been analyzing the books of members of the association for the past six weeks in an effort to find out whether the industry is slipping, going ahead, or standing still, reported at this meeting that charts and graphs showing present conditions have been completed. This very important report will be given at the next meeting of the association to be held on March 24, at which time they will present, without divulging any names, the story of these members, which will reflect the condition of the industry here.



Run five days instead of Three

Why didn't you operate 100% last year? Couldn't you have sold more paper if it had been better quality? If you could improve the quality of your paper, couldn't you get more business?

Why not make better paper, get more business and run the mill five days instead of three?

Make the Paper in your Beaters and install more and better Beaters if you need them.

Let us make a survey of your Beater Room and submit a report with suggestions. No obligation will be incurred.

SEND THE COUPON TO

Dilts

MACHINE WORKS Inc. FULTON, N.Y.

"Your Paper is made in your Beaters"

Dilts Machine Works, Inc.
Fulton, New York

Gentlemen: Without obligating ourselves, we would like to discuss with your representatives, certain details pertaining to our Beater Room.

Company Name .....

Address ..... **By** .....

Newfoundland's News Print Project Held Up

Government's Action In Issuing Writs Against Gander Leaseholders Delays Sale of Properties to Parties Interested In Establishing Great News Print Plant — Allan Butler, Holder of Timber Areas and Water Powers, Submits Basis of Settlement to Government

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 16, 1931.—Announcement by the Newfoundland Government of a move in its great Gander River news print project, promptly followed by an action for $10,000,000 damages against the Government, created a sensation in news print circles here this week. The Government's announcement came in a speech from the Throne at the opening of Parliament. This speech, forecasting the legislation to be introduced at the session, stated that the text of a proposal made by Allan Butler to the government in relation to the Gander timber areas and water powers would be submitted. This area, formerly under the control of the Reid Newfoundland Company and now understood to be held by Mr. Butler under mortgage, has been the subject of negotiation for several years, and formed the basis of a project last year whereby a subsidiary of the Hearst syndicate proposed erecting a mill with a daily output of 1,000 tons, providing additional timber could also be obtained in Labrador.

In order to prevent disintegration of the Gander property, said the speech, Mr. Butler submitted the following basis of settlement:

"The Government to purchase from him a proportion of his bonds, somewhat less than fifty per cent, for $875,000 at par plus accrued interest. The bonds bear interest at 7 per cent and are secured by the entire assets of the Reid Company.

"Second, the Government to remove the present writs, accept the rentals and reinstate all the properties and extend the Gander charter for two years from September 15 next. The act extending the charter to include a new clause containing the provision set out in the order-in-council of August last to provide that a further extension of the charter from time to time shall be made provided the Reids have made reasonably serious and bona fide efforts for the establishment of an industry.

"Third, the Reid Company and the trustees for the Reids to enter into a binding agreement with the Government that neither the freehold lands nor the water powers included in the Gander scheme shall at any time be sold without the consent of the Government unless as part of the Gander development.

"The whole is submitted without prejudice to any rights which Mr. Butler or the Reids may now possess."

Incidentally it was mentioned that pulp and paper exports from Newfoundland last year exceeded those of the previous year by 32,000 tons.

Subsequent to the tabling of the memorandum mentioned above, the Prime Minister, Sir Richard Squires, tabled certain correspondence containing a notice served upon the Government by Conroy & Conroy, solicitors for Mr. Butler, to the effect that within a month, unless the memorandum was accepted, action would be taken for damages estimated at $10,000,000 resulting, it is alleged, from the Government's action in issuing writs against the timber leases held by the Reids and their associated companies, thus preventing the sale of the properties to parties who, it is stated, were prepared to conclude an agreement to establish a news print plant on the Gander property. These writs were issued against the leaseholders on the grounds that certain terms of the grants had not been complied with.

Allan Butler is chairman of De Havilland Ltd. and a well-known flier.

Premier Tarchereau Replies to Attacks

Premier Taschereau has replied to attacks leveled against the Quebec Government in the Legislature regarding the Government's attitude toward the pulp and paper industry and especially in regard to the alleged attempt to fix news print prices and to intimidate the International Paper Company. The Premier insisted that never had he and ex-Premier Ferguson sought to fix prices, but that there was a Newsprint Institute which had taken a hand in the matter.

Maurice Duplessis, Conservative member for Three Rivers, said the Premier had declared in the House that some companies would be treated in a manner different from others, and an attempt had been made to treat International Paper Company in a manner different from the treatment accorded the Canada Power and Paper Company. The latter company had been allowed to cut trees below the usual size, but when the International Company had done the same, it had been threatened with fines.

However, said Mr. Duplessis, the Government had not insisted when the company declared it would pass on the fines to its jobbers, for the latter were good and influential electors.

"That is a piece of imagination," said Mr. Taschereau. He proceeded to say that the news print crisis was part of the world crisis. Business was not flourishing, and one important result was that newspaper advertising had fallen off, but why hurl blame upon the Government especially? He suggested it would be better if people held their heads high and kept their courage to the forefront and worked togethr. As regards news print, he felt confident that in a very few years the province would be the center of news print production, since it has good labor conditions, fine forests and available water powers in great quantities. The sun would soon shine again, commented the Premier. He pointed out that mills in the United States had closed to a great extent, so it was not only here that the world crisis had struck the news print industry.

The Premier said he had said in the House last year the International Paper Company had been audacious in fixing a price of $55 a ton for news print on five-year contracts when it did not know what the stumpage dues would be, but he could say at present that owing to new conditions in the forests, with men available at $1 a day, and the installation of new machinery which can produce at lower costs, it would be possible to cut the price of news print down by $5, making it $50 a ton.

What had prevented companies from bringing down prices was the fact they had faced a situation in which they had large quantities of news print produced under high cost conditions, which the news print companies had to get rid of. Mr. Taschereau said one newspaper proprietor had told him his advertising had been down 1,000,000 agate lines in 1930, and that meant naturally less consumption of news print, so it could not be said that foresight had been lacking. Since that time there had been demands for forest limits extensions, but the Government had refused them, such as that of the St. Regis Paper Company which had wanted to establish at Sillery, and at Dolbeau, and the Government had also not insisted on the Ontario Paper Company going ahead with its mill at the Riviere des Outardes.

Mr. Houde, leader of the Opposition, said the news print crisis had come prior to the world crisis, before the crash of the stock market, so there must have been another reason for the

Machine illustrated above is the Waldron "Centennial" Embosser

If It's Equipment For Paper Converting —*consult* Waldron

This century old organization of machine building specialists stands ready to assist progressive manufacturers to take full advantage of the new opportunities for greatly increased business. Never before has the future looked so bright for those who are prepared and equipped to meet the increasing demand for Utility Trims and Wraps, Box Papers, Single Purpose Servers, Etc. You may simply want information on the elements of this expanding market; or advice on improved products and effects that are within range of your present equipment; or expert engineering data concerning necessary new equipment for your plant.

Whatever your requirements, if it is in connection with Paper Converting, use the facilities and service of our Engineering Dept. Write for copy, "Converting of Light Weight Papers."

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WALDRON

Paper Converting Machinery

news print trouble. True, mills were closed in the United States, like those of the International Paper Company, but this was due to the fact that such mills had been included in the arrangement with the Newsprint Institute, the International Paper Company having condescended to close the mills, but the result had been that in doing so the company had brought many of its people to this province, and produced on a basis of 125 per cent of capacity in Canada and that had aggravated the crisis in Canada as regards news print.

Mayor Thompson and King George

Some amusement has been caused here by receipt of copies of the London Daily Express containing an interview by overseas telephone between a reporter of that paper and Mayor Thompson, of Chicago. Here is the passage that is causing a smile:

"Is it true,' I inquired, "that you blame King George for supplying pulp to a Chicago newspaper?"

"Yes, sir-r, it is," he replied, after a second's deliberation. 'They get their pulp from Ontario, in Canada, where they have leased twelve hundred square miles of territory, and King George figgers in the transaction."

"How do you make that out?" I asked.

"Well, it's on the contract for any one to see, sir-r," he explained, with what seemed to be a touch of tolerance for my insistence. "His name's right at the top of the document—'I, George the Fifth, by the Grace of God King of England. . . .' That's proof, isn't it?"

Committee Acts to Protect Canada Power Securities

Security holders of Canada Power and Paper Corporation and subsidiaries have formed a committee to protect their interests in the crisis in the affairs of the corporation which has developed as a result of the generally unhealthy conditions prevailing in the news print industry during the past year or two. The situation has been precipitated by the recent passing of dividends on the preferred shares of subsidiary companies, and the definite indications that interest on the debentures for the current half year will not be met.

The following have agreed to serve on the Committee: The Hon. Chas. A. Dunning, former Minister of Finance; E. A. Macnutt, treasurer, Sun Life Assurance Company of Canada; S. Kilpatrick, partner, Govett, Sons & Co., London, England; Norman Dawes, president, Montreal Board of Trade; John J. Rudolf, partner, A. Iselin & Co., New York; Strachan Johnston, K.C., partner, Tilley, Johnston & Co., Toronto, and R. H. Collis, partner, Kilcat & Aitken, London, England.

The committee, which will carefully study the whole Canada Power and Paper situation in the interests of the security holders, has appointed the Hon. Chas. A. Dunning as chairman, and Gordon Scott, of P. S. Ross & Sons, chartered accountants, Royal Bank Building, Montreal, as secretary.

In its annual report for 1930, Canada Power and Paper was forced to omit making any write-off for depreciation and depletion in order to show debenture interest fully earned. Conditions in the industry have become intensified during the earlier months of this year, and the early outlook is unpromising. A physical review of news print conditions in Canada as at end of last year shows that capacity of Canada Power mills alone is close to aggregate mill capacity in the Dominion as at the end of 1920. Total mill capacity at the beginning of this year in Canada is 12,015 tons daily, or 3,631,500 tons a year. As against this huge mill capacity, demand from Canadian mills in 1930 amounted to only 2,501,093 tons and, during the peak year of 1929 was 2,728,872 tons. It will be seen that mill capacity in the country exceeds consumption by over 1,000,000 tons.

Comparison of operating results of Canada Power and Paper with those of other leaders in the industry shows that the former has been much more seriously hit; hence the findings of the strong international committee which has been formed will be followed with considerable interest by the many holders of the various outstanding securities.

St. Lawrence Corp. Cuts Dividend

St. Lawrence Corporation, Ltd., has declared a dividend on Class "A" stock of 25 cents a share, being at the rate of $1 per annum. A dividend was also declared on St. Lawrence Paper Mills preferred stock. This dividend will be payable April 15th in the amount of 75 cents per share, which is equivalent to an annual rate of $3 per share. Both disbursements are at half the rate prevailing hitherto.

It will be recalled that St. Lawrence Corporation was formed in May, 1930, for the purpose of amalgamating, through stock ownership, the St. Lawrence Paper Mills Company, Ltd., Brompton Pulp and Power Company and Lake St. John Power and Paper Company. The $2 Class "A" preferred stock of St. Lawrence Corporation was given in exchange for common stock of Brompton Pulp and Paper on a share-for-share basis. In the amalgamation, the 6 per cent preferred stock of St. Lawrence Paper Mills Company, Ltd., remained undisturbed and continues to be the senior security of that company.

Price Bros. & Co. Earn Dividend

It is announced here that Price Bros. & Co. brought their fiscal year to a close on February 28 with operating results much more favorable than those obtained by the bulk of operators in the news print industry during the year 1930. It is understood that the $2 dividend on the company's common stock will be shown as earned by a fair margin.

Though maintaining an independent position, it is understood that Price Bros. obtained a liberal share of the news print business during a period when there was a reduction in demand for news print from the mills in Canada as compared with 1929. The favorable geographical position of the company's properties was and is a decided factor in keeping overhead charges down.

Diversification of products kept all the Price Bros. mills running while other companies were closing down some of their plants. The company is extending its markets to South America, shipments of insulating lumber being sent to distributing agents in that country. The research department of the company is classed among the finest in the Dominion, amply repaying its originators by constantly improving lines and finding new methods and uses for by-products of wood.

E. B. Eddy Co.'s Expansion

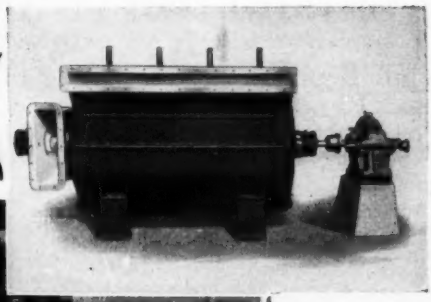
The contract for the erection of the new water filtration plant for the E. B. Eddy Co., of Hull, involving approximately $250,000, has been awarded to Foundation Company of Canada. This contract represents an initial step in the rehabilitation of the Eddy news print and fine paper manufacturing facilities.

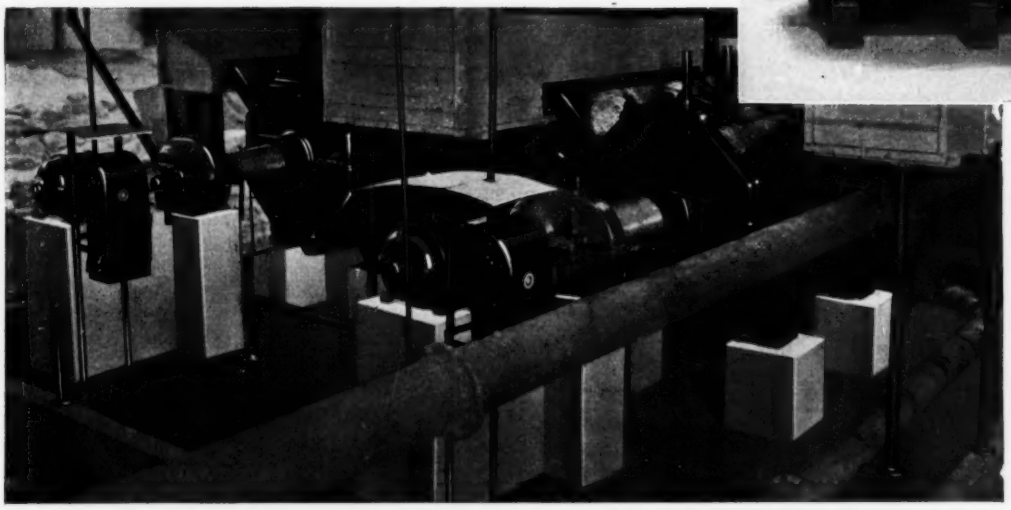
The immediate capacity of the filtration plant will be 36,000,000 gallons per day, which will take care of the present needs. The plant, however, is designed for an ultimate capacity of 60,000,000 gallons a day, approximately one third of which will be chemically treated and filtered and the balance screened.

On completion of the filtration plant, it is expected that conditions will warrant the complete rebuilding and equipment of sulphite pulp mill, bleaching plant, and ground wood pulp mill. The intention is to consolidate the boiler capacities and to replace the present units by new and larger ones. Other improvements include the re-arrangement of wood storage and additional handling facilities, new wood rooms and pulp storage and handling equipment.

The final phases will be undertaken to provide for the installation of four new fine and specialty paper machines of the Fourdrinier type and one cylinder type machine. This installation will entail additional pulp-preparation equipment. To round out the program, adequate finishing, converting and shipping facilities are planned, together with a new head office building.

Compare this





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Right now—check up the cost of cleaning and repairs in your Screen Room.

Chances are you'll be shocked! Yet, this sizable amount is only one of the savings of the Valley-Thune Rotary Screen.

There is no overflow or leakage. Hence, no slimy slop to clean up. There is no incessant din of noise and vibration. Hence, no need for constant, costly repairs.

The drum ... on the inside ... is the only moving part. It is mounted in anti-friction bearings. The resulting absence of vibration and need for maintenance is obvious.

Plate maintenance is the only upkeep cost. But—since the adoption of FLAT, SLOTTED PLATES—even this item has been reduced to a bed rock minimum.

We would be pleased to give you complete information. Write the Valley Iron Works Co., Appleton, Wisconsin.

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New York Office: 350 Madison Ave.
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Demand for Paper Irregular in Philadelphia

While Better Grades of Writing and Book Papers Are In Fairly Satisfactory Request, Cheaper Grades Are Only Moderately Active—Some Paper Merchants Report Broadening of Wrapping Paper Buying—Mill Improvements and Developments.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 16, 1931.—While a few paper merchants report greater activity and broadening of spring buying in the wrapping paper division, fine paper dealers continue to enjoy a fair volume of orders in the better grades of writings and book papers, although the cheaper lines show a dragginess that indicates dullness among commercial printers and other consumers. Card boards are moving in small but broadening volume. Prices of fine paper are steady, except among the mill representatives, who have been attracting orders by fractional reductions to gain tonnage for the manufacturers until such time as broadening operation will permit of returning firmness. While the paper trade has been looking forward to advancing prices there are no sign of such a movement so far this month.

Folding boxes, tissues, large merchandise sacks, and such products, have been moving in improved volume. Envelopes have been reduced almost 10 per cent, while bags took another tumble of 5 per cent after a similar reduction a few weeks ago. Pie plates have been reduced 5 per cent. In the matter of reductions in envelopes announced in the week, the local trade sees no reason for this slaughter in prices, as envelope papers are selling at parity with last year quotations. The only incentive, it is believed, is that reductions may stimulate demand. Box makers' fancy papers were likewise reduced within the fortnight, with cuts of from 5 to 10 per cent. While roofings are slow they hold steadily to last year's prices. Building papers are quiet.

Paper Men Hear of Convention Activities

Members of the Philadelphia Paper Trade Association met at the Down Town Club last Wednesday and heard President W. S. Wilcox, of the local organization, and of the Wilcox, Walter, Furlong Company, give a detailed report of the recent national convention held in early February in New York. President Wilcox, who attended the convention, reviewed the many features of the program on fine papers in detail and urged his associates to become aligned with the constructive work that is carried on in behalf of the trade by the National Paper Trade Association.

Paper Men Urged to Send Operating Percentages

At the luncheon meeting President Wilcox urged the paper merchants to send their 1930 operating percentages to the National Paper Trade Association and its statistical experts, Ernst & Ernst, New York, who are linked with the work of compiling records for that organization. The dealers were urged to do this at an early date so that Ernst & Ernst might be able to complete its nation wide survey of the industry. It was stated that several Philadelphia firms have not yet reported and President Wilcox requested that those who have not sent in such reports do so before the month is out. There will also be filed an exclusive report on this matter for the Philadelphia fine paper trade, covering operating percentages for the past year.

William Mann Mills Under New Control

With the purchase of the former mills of the William Mann Company, with headquarters at Fifth and Market streets, the old plant of the Shen King papers passes into the hands of new interests who will conduct a tissue manufacturing concern under the title of the Mann Paper & Pulp Company. The mills, located at Lamberville, N. J., are being renovated and converted into modern paper making quarters and will be ready for operation shortly. The head of the new enterprise is M. F. Middleton, who for many years was president of the Philadelphia Stock Exchange, and conducts a stock brokerage business in this city. Addition of new units and rebuilding of other equipment is under way. Walter Cochran, who has been connected with the paper manufacturing branch, is in active management of the mills. The mills are over eighty years old and for many years prior to the death of the founder of the William Mann Company were engaged in the production of the famous Shen King papers used by railroads and large corporations for duplicating purposes. About ten years ago they were remodeled for manufacture of carbon papers and in the past few years have been idle.

Paper Products Mfg. Co. Increases Capacity

The rebuilding of the old mills which were destroyed by fire over a year ago and the extension of production, enables the Paper Products Manufacturing Company, on Crum Creek, Swarthmore, to materially increase its output of crepe papers, sanitary products and surgical bandages of tissue. The firm, of which W. S. Sprague is head, has added another paper machine and this year is operating three machines instead of the two destroyed in the recent fire. An entirely new mill building supplants the century old structure known as the Lewis mill. There has been installed General Electric BTA motors of variable speed operated on alternating current. Other G. E. equipment consists of switch board and transformers. The mills are the oldest tissue making unit in this section, having continuously been devoted to this type of paper making for over one hundred years.

Morgan Paper Co. Mills Remodeled

Among the specially efficient mills operating on tissues in this section of the country, are those of the Morgan Paper Company Division of the United States Envelope Company, at Lititz, Pa., which have been completed recently and are now devoted to production of tissues for the envelope manufacturers and colored tissue rolls for the trade. The mils, which formerly were those of the Consumers Box Board and Paper Company, have been fitted with electrical units that provide for operation by steam and electric power. Two paper making machines have been rebuilt by the Moore & White Company of Philadelphia, and brought up to date. They have been equipped with General Electric BTA motors of variable speed and alternating current. A new addition has been built to the old mill building which is a land mark in this State and in which was found a portion of the equipment known as "Nigger Head," of the first paper mill in America, the David Rittenhouse Mill, of Philadelphia, which will be placed in the permanent paper exhibit to be installed in the Franklin Memorial on the Parkway when completed. The new addition is given over to production of roll tissues in white and colors. These roll sanitary products are made in colors and scented to match bathroom surroundings and are produced in a variety of shades. They are of high quality and produced to meet modern ideas of fixtures. The mills have been equipped with automatic sprinklers throughout. The remodeling was accomplished in late 1930, ready for expansions this year.

Auto-Kraft Box Corp. Opens Plant

A new plant has been opened by the Auto Kraft Box Corporation at Porter and Swanson streets, for the manufacture of boxes

used by the cigar and cigarette industries. The new plant produces paper cartons and regular cigar boxes and is a branch of the main plant located in Lima, Ohio. The new quarters provide for 30,000 square feet of space. Other Pennsylvania plants are maintained in York, Hanover, and others in Cincinnati, Detroit, Chicago, St. Louis, Kansas City and Wheeling. The local plant is an up-to-date electrically operated division with automatic machinery.

Hinde & Dauche Complete Corrugated Plant

Hinde and Dauche Paper Company, with local offices in the Drexel Building, has developed special radio boxes used by the Philco manufacturers at its radio division of the Philadelphia Storage Battery Company, for packing and shipping Philco radios. A special corrugated product has been perfected for this purpose. To speed up deliveries of its corrugated products the Hinde & Dauche company has built an Eastern plant in Baltimore under management of Gilbert Rosenau, which is one of the most modern and most completely equipped in the East. Lawrence P. Jones, who formerly was associated with the Philadelphia office, has been transferred to Columbus, Ohio, as branch office manager. He recently announced his marriage to Miss Lilian Hyslop of Cleveland.

Paper Houses Entertained by Purchasing Agents

Among the paper houses and converters of paper products represented at the Advertisers Night banquet of the Purchasing Agents Association of Philadelphia last Wednesday, in the Penn Athletic Club, were the Hinde & Dauche Company, represented by Harry P. Johnson, Philadelphia manager, Albert E. Jones and Richard Frishmuth; Walter P. Miller, Walter P. Miller Inc.; Frank A. O'Neill, Paper Manufacturers Company; Louis Macchi, Container Corporation of America; T. H. B. Smythe, J. L. N. Smythe Company; H. Jefferson Smith, Frederick A. Dubb and Theodore Johnston, Thomas W. Price Company; D. F. Coots, Whiting Paper Company; G. H. Beatty, Whiting Patterson Company and the West Disinfecting Company. The banquet was tendered to those firms represented as advertisers in the Purchaser magazine of that organization.

Scott Paper Co. Moves Philadelphia Office

The Philadelphia offices of the Scott Paper Company, of Chester, Pa., have been removed from the Packard Building to Room 1203 in the Lewis Tower Building, at Fifteenth and Locust streets. C. S. Beilfuss, who was recently made manager of the Philadelphia district will make his headquarters at the new location. The Philadelphia offices are devoted to sales of Scott tissues in this city and territory.

Magnolia Paper Co. To Build

FORT WORTH, Tex., March 14, 1931.—Plans for a new $75,000 to $100,000 building for the Magnolia Paper Company are being prepared and the general contract will be let soon, A. G. Schroer, general manager, announced last week.

The new structure will be erected adjoining the company's present plant at 601 East Second street. It will be 100 feet by 100 feet and will have a basement. It will give the company a plant 150 feet by 100 feet, as the present building faces 50 feet on East Second street and is 100 feet deep.

New presses and additional printing equipment will be installed. It is expected that when the new building is completed work will be provided for at least 25 men.

The Fort Worth plant, after it is enlarged, will serve all North and West Texas territory of the company, and salesmen in these sections will have headquarters here, Mr. Schroer said.

Paper Machine Equipment

Equipment for bettering the formation and caliper of paper is described in detail in a bulletin issued by the Valley Iron Works Company, of Appleton, Wis.

Butler-Dearden Paper Service Formed

[FROM OUR REGULAR CORRESPONDENT]

WORCESTER, Mass., March 16, 1931.—The Butler-Dearden Paper Service, Inc., a recently organized Massachusetts corporation, has established a business new to Worcester, with spacious quarters on the second floor of the Perkins & Butler building at 12 Federal street. The company will sell fine printing papers to the printers' trade in conjunction with a comprehensive "paper service," which means the solving of customers' printing problems, including the selection of paper, color schemes and the various other details which enter into appropriate and effective printing. The company has made business connections with important mills manufacturing papers of the highest grades.

The officers of the new company are Walter G. Butler, president; C. Walter Dearden, treasurer, and E. Claire Butler, clerk, the three constituting the board of directors. Walter and Claire Butler and their house, the Perkins & Butler Company, are closely and prominently identified with the coarse paper business of which their father was a founder. Mr. Dearden has had many years of successful experience in the fine paper business, particularly in its relation to sales promotion and otherwise as it affects the needs of users of the better grades. Distinctive, discriminating selection of paper has come to be an art in itself, to which Mr. Dearden has applied himself with conspicuous success.

He comes to Worcester with the prestige of 23 years as advertising manager of the Strathmore Paper Company, one of the great and progressive leaders of the fine paper industry, and five years with the Rourke-Eno Paper Company of Hartford, Conn., where he came even closer to the problems of the printer and the advertiser. Sales promotion has been his specialty. In fact, in his last four years with the Strathmore Company he was its sales promotion manager.

Under his direction were produced the company's many beautiful and practical specimen books which have made the Strathmore advertising famous. The selling slogans, "Paper Does Express," and "Paper Is Part of the Picture," were then initiated. So also was the "Grammar of Color," which made possible the practical use of the Munsell Color System by the printer and advertiser. He was the "inventor" of the mythical "Strathmore Town."

Mr. Dearden has been an active figure in printing and advertising circles. He was one of the nine founders of the Association of National Advertisers, a charter member and an ex-president of the Springfield Publicity Club; a member of the Direct Mail Advertising Association; a founder and ex-president of the Paper Makers' Advertising Club; an organizer and chairman of the National Advertisers' Group of Springfield, and a member of the American Institute of Graphic Arts.

The Butler-Dearden Paper Service, Inc., starts business with the following mill connections: Strathmore Paper Company, American Writing Paper Co., Miller Falls Paper Company, Parsons Paper Co., Rising Paper Company, Crocker-McElwain Co., Chemical Paper Manufacturing Company, Advertisers Paper Company, Knowlton Brothers, George W. Wheelwright Paper Co., the Marvellum Co., the N. Y. & N. E. Company, Holyoke Card & Paper Co., Hampden Glazed Paper and Card Company, Hollingsworth-Whitney Company, J. P. Lewis Co., Ticonderoga Pulp and Paper Co., United States Envelope Company, and Old Colony Envelope Company.

Rainier Pulp & Paper Co. Not To Move

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 14, 1931.—The Rainier Pulp and Paper company, which had plans under consideration for moving from Shelton, Wash., will remain in that town, according to recent decision of officials in San Francisco. The motive which prompted the talk of moving was trouble with owners of the oyster beds who complained of poison from mill waste. It was not announced what agreement was reached to cause a change in plans.

An Old Timer's Reminiscences

By Joseph H. Wallace, Pres., Joseph H. Wallace & Co.

(Continued from last week)

If you had a hurryup call to go from New York to Oslo, Norway, thence to the northern part of Trondhjem; thence to Vancouver, British Columbia; thence up the coast to Alaska and thence to Quebec, and everyone was in a mad rush,—would you feel busy? Well, we did when it happened to us once, and during the same period we had to decline an interesting visit to mills in Finland toward which we were pushing when the call came for a trip up the British Columbia Coast on a motor boat for an inspection of several sites where the paper business was being considered by British financial interests for whom we acted as engineers. We were busy in England when a trip to Norway was decided on in the interest of clients who owned shares in several Norwegian plants, so the hurry really began in London, where one doesn't hurry!

To Hull for a steamer across the North Sea, the "old Debble sea," if ever there was one, visits to Lilestrom, and Theodore Quiller, inventor and sulphite expert, to Labia, where an old employee of Wallace & Co., (H. Melby by name) showed us proudly the mill he was operating. Skein, where Union Mills entertained us with a feast in true Norsk grandeur, then that wonderful trip over the mountains to Trondhjem up near the Arctic Circle where we were almost overcome by sunstroke, and then, abandoning the trip scurrying back to Hull, across England to catch the Lusitania and just making it, one day in New York, thence westward and on arriving at Vancouver, stepping immediately on "the Anvil," a motor yacht, which was waiting for us, and so forth.

Development of Ocean Falls

Such a trip for seeing sights, landings at Cousin's Inlet with examination of timber and power right on tide water, where now are the Pacific Mills, with fine modern paper machines and incidental mechanical, sulphite and sulphate pulp plants. We had the pleasure of designing the general layout, power development and ground wood pulp plant which formed the first step in the development of Ocean Falls, British Columbia. It was certainly a place where the paper business was intended. A. B. Martin, now president of Pacific Mills, Ltd., was on this trip and will perhaps recall the poker and story competitions that passed the evenings also breakfast the last day on the boat when the party wore *evening clothes* and had pictures taken. We remember the trip as a wonderful experience—it included visits to practically all of the sites where British Columbia pulp and paper plants have since been located.

Every Engineer Has Had a Whack at It

Coming East, after a week at the exposition which was being held at Seattle, we examined and reported on projects at Dryden, Ontario, and Soo, Michigan, where a big news plant was contemplated. When we got to New York, we found Charles Weston of Scranton, Pennsylvania, awaiting us, regarding the property of Cherry River Paper Company at Richmond, West Virginia. This interview resulted in several years' engineering for that company amounting to a complete rebuilding of the plant.

Mr. Weston apologized for hiring me as an engineer by stating that he had just been elected president of the company and knew nothing of the paper business. He could read, however, and had been reading the company's correspondence with engineers since it was first organized. In looking at the paper trade magazines and checking up, he had concluded that, as every other engineer in the paper field "had had a whack at it," it appeared to be my turn! Very much appreciated, and to know Weston is to be well paid—he is one of the best men we ever dealt with, and being an engineer by profession hasn't hurt him a bit.

Sir William Never Wasted Time

One day Dr. Frederick S. Pierson—"the Mexico Pierson," who was afterward lost on the Lusitania, called me on the phone, saying, "Sir William Mackenzie is on his way to your office with a problem." Soon came Sir William. The Canadian Northern Railway had crossed a property in Quebec and were being sued for damages on account of the location of the railroad on the property which it was alleged made it impossible to build a large newspaper plant there in the manner that they had wanted. The depositions on the part of the plaintiffs who owned the land, had been put into evidence and the railroad had a few days in which to put in testimony for the defense.

Sir William Mackenzie never wasted any time. He came in with some papers, and said, "look these over tonight and have breakfast with me at the Waldorf Astoria at 8 A.M. tomorrow prepared to tell me what evidence can be prepared to defend this case in a week." Then he left. The case had taken months in preparation and had evidence galore to prove that "one couldn't now build the sort of plant one wanted to build there"—six well known experts in designing mills had each shown how he would have designed a mill to please the owners at this site if the railroad hadn't made it impossible. It was obvious that one couldn't find six more well known experts to show how they would severally have designed the plant and even *that* would only produce the answer that the owners didn't like the defendent's layouts—and thus get nowhere.

About two o'clock the next morning after several coffee pots had been drained and a small box of cigars sadly depleted, the puzzle was solved by the vast array of expert testimony already in the case—showing various things that the plaintiff had admitted that they would have liked for arrangements of various parts of the plant they wanted.

Adding Insult to Injury

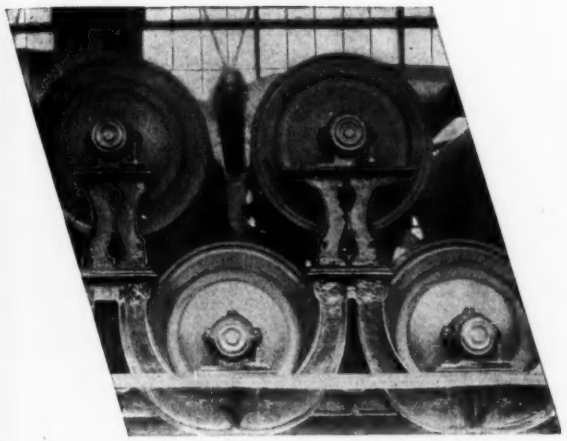
By using the hydraulic arrangements of one of their experts, the wood handling arrangements of another, the mechanical pulp plant of another, and so on, a composite layout was arrived at, no part of which could be objected to since it was stolen from the experts' reports already put into the testimony by the plaintiff. I remember Sir William's remark when the proposed testimony was shown him at breakfast, "That's good." That was all he said—and we had several nice little problems later because of his satisfaction in this case, which was immediately settled by dropping the suit after our program was shown to the plaintiff's lawyers. I remember this incident as a case where too much expert testimony was disastrous.

The sequel came a year later when two of the owners of the property came to our office and stated that they wanted a blueprint of that general plan that had beaten them. We had to decline to deliver on two grounds:—(1) It belonged to the railroad, (2) it was a bum layout. They laughed and said "that is adding insult to injury."

Saguenay Developments

From our acquaintance with Dr. Pierson and Sir William Mackenzie we came to be brought into the early program of the Saguenay developments—and to know that genius Thomas L. Willson—"Carbide Willson," as he was known to the world, after his exploits with carbide of calcium. Willson and I were the guests of Hudson Maxim one weekend at his place at Lake Hopatcong, New Jersey, where we learned the possibilities of

How about your present Vapor Absorption System



does it need remodelling

Perhaps you have increased the size of your plant—or of your machine. In this case, is your present vapor absorption system inadequate to cope with the changed conditions and increased production. We can conveniently remodel it for you at comparatively small cost.

The most Practical Method—from Any Angle—for Avoiding Vapor Troubles on Paper Machines

Major vapor troubles on paper machines result in seriously retarded drying; uneven drying; formation of blisters and cockles; low drying capacity; high dryer steam pressure. An adequate efficient vapor absorption system completely corrects all these obstacles to profitable production without burdensome expense for equipment and maintenance.

It is not necessary to practically rebuild your dryer equipment at great expense in order to be free from vapor troubles. The Ross Vapor Absorption System can be quickly installed in conjunction with your present dryers. From a standpoint of initial cost, operating cost and results secured—it is the most efficient and economical system available.

Many of our contracts are for remodeling present vapor absorption systems. We can use what material you now have—thus effecting worth-while savings to you. Ask for our recommendations

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NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

tennis, fast driving in a Ford car, and a speed boat, the cooking of baked beans, and the mathematics of poetry and music from that very delightful young (?) wizard inventor who was over the allotted "three score years and ten," had lost an arm, and acquired a youthful wife and was apparently just thoroughly enjoying the life of a youngster.

Mexico in 1910

Dr. Pierson sent me to Mexico in 1910, to locate, and design a sulphate pulp and kraft paper mill at Madero in Chihuahua, in connection with the Mexico Northwestern Lumber Company. The pine of Chihuahua is quite similar to some of our Southern pines and a huge saw mill was operating at the time. This mill had been designed by saw mill operators from the north and followed the usual northern practice of floating the logs to the log hauls. The first train load of logs was dumped into the pond and slowly disappeared, as this pine was too heavy to float—what a mess! At the city of Chihuahua and up into the woods over the Mexico Northwestern Railroad, we found much to interest us.

Soon after this, Madero was assassinated and Villa ran wild, so the proposed developments were postponed and have not been built. At Jaurez, we attended a fair and horse racing and picked winners for the first time in our young lives so we liked Mexican ponies very much. We mean to go back some day—build that mill and attend some more races. Quien sabe?

Showing Magnus Hanson American Mills

The Magnus Hanson, the famous sulphite mill designer came from Stockholm and kept us busy showing him American mills and filling his glass! Afterward we hunted for mill sites from Charleston, South Carolina to Beaumont, Texas, and chose Moss Point, Mississippi, for the first mill to use Carlson's methods on long leaf southern pine wood. To England, Scotland, Switzerland and then to Ocean Falls, British Columbia, to start operations and a finish of the decade with a trip to Swedish mills with Arthur Millington—now of Firtex on the Pacific Coast.

That trip was a hard one as I not only had to travel fast to keep up with Millington and Magnus Hanson, but I had to drink fast too! I'll never forget introducing Millington to "Aqua Vit" and telling him how to throw it down quickly because otherwise his guests would think he didn't like it. He nearly strangled and so did the entire company in trying not to laugh!

Millington a Hard Man to Follow

Millington certainly was a hard man to follow through Europe and I am wondering how we escaped arrest. I found my bag full of knives, forks and even soup tureens that he picked up from time to time. While in Berlin, Millington felt that he must send post cards home, and decided he knew how to do it and waste no time from the wild parties. So he called a boy to his room, told him to go and select one hundred postcards about Germany. The boy soon returned. Millington paid for the cards and said, "That is *the* way to see Germany, and to let your friends know you saw it." And I went over and looked at the cards and they were all alike!

Traveling in Sweden with a young English Army officer, we put up a job on him by having the best looking maid in the hotel prepare his bath and insist on bathing him. He was so fussed that we who were listening laughed aloud. Then he refused to notice us for the balance of the day.

A Straw for Sun and a Bowler for Rain

One English gentleman traveling in Norway in summer had two hats with him all the time. If sunny, he wore a straw and carried a derby or "bowler" as he called it in his hand. If it looked like rain he changed hats, but always carried the other.

When Arthur Millington and I were crossing the Atlantic on the Kronprincess Cecile for Bremen, we noticed we were left to ourselves. Nobody appeared to like our style. When we landed we sent a telegram to Jim Sickman awaiting us at Berlin, as follows: "Berlin eight o'clock tonight. Look out for trouble. Signed Millway." Before we got to the train we had to explain to the police that it was a joke. And one of them finally left us saying, "We shall be only too pleased to help you; we have known from the ship's officers that you were secret service detectives." Millington recovered after a time and said, "What a guilty bunch must have been on board that ship."

(To be Continued)

Moving Picture Films on Paper

Jesse H. Neal, general manager of the American Paper and Pulp Association, announces the following list of films produced by the various paper companies:—

1. American Writing Paper Co., Holyoke, Mass., 1 and 2 reels, "The Right Paper for the Purpose."
2. Butler Paper Co., Chicago, Ill., 4½ reels, "Romance of Paper."
3. The Celotex Co., 919 N. Michigan Ave., Chicago, Ill., 2 reels, "From Bagasse to Builder."
4. Crystal Tissue Co., Middletown, Ohio, 1 reel, "Making Tissue Paper."
5. P. H. Glatfelter Co., Spring Grove, Pa., 2 reels, "A Short Course in Paper-Making."
6. Hammermill Paper Co., Erie, Pa., 3 and 4 reels, "The Voice of Business."
7. Individual Drinking Cup Co., Easton, Pa., 1 reel, "The Cup of Health."
8. International Paper Co., 220 E. 42nd St., New York, 6 reels, "Paper."
9. Mead Corp., Dayton, Ohio, 2 reels, "From Spruce to News Print."
10. Mead Corp., Dayton, Ohio, 8 reels, "From Spruce to News Print."
11. Nekoosa-Edwards Paper Co., Port Edwards, Wis., 1 reel, "Safety Picnic."
12. Oxford Paper Co., 230 Park Ave., New York, 4 reels, "The Romance of Paper Manufacture."
13. Scott Paper Co., Chester, Pa., 1 reel, "Thirsty Fibre."
14. Strathmore Paper Co., West Springfield, Mass., 1 reel, "Making Fine Paper from Rags."
15. Wallpaper Ass'n of the U. S., 10 E. 40th St., New York, 2 reels, "Close-ups in the Manufacture and Hanging of Wall Paper."
16. West Virginia Pulp and Paper Co., 1 reel, "When the Trees Talk."

C-E Stoker Unit

Combustion Engineering Corporation, 200 Madison avenue, New York, has recently placed on the market, the C-E Stoker Unit, which is a self-contained underfeed stoker with electric drive and integral fan construction.

This stoker has been developed to provide a simple automatic machine for the firing of small boilers up to 150 hp. It has a number of features not available in other machines of its size, such as agitated grate bars, side dumping grates and agitated feed hopper which eliminates arching of the coal and interrupted feed.

The design is self-contained, completely enclosed and provides a simple rugged and dependable unit for the underfeeding of coal under small boilers. Three sizes are available with coal burning capacities of 300 lb., 600 lb. and 1,000 lb. of coal per hour, respectively.

Due to its unit construction, a C-E Stoker Unit may be installed and placed in operation in 6 to 12 hours.

The folder includes photographs and application drawing, a table of dimensions and capacities for the three sizes, and a discussion of the features of the stoker.

DOWN COMES THE PRICE

of the NOBLE & WOOD IMPROVED PULPER

This isn't a bargain sale announcement. It's simply a case of cutting costs — reducing prices — through increased production.

Production overhead on a new machine, with all the planning, new patterns, jigs, tests and so on, is heavy. With production details and schedules established and with the general downward tendency of material prices, economies have been effected which we are glad to pass on to you.

If cost has kept you from enjoying the many advantages of the Improved Pulper, write for the new revised prices, NOW. They'll save you money at the start just as the Pulper saves you money all along the line.

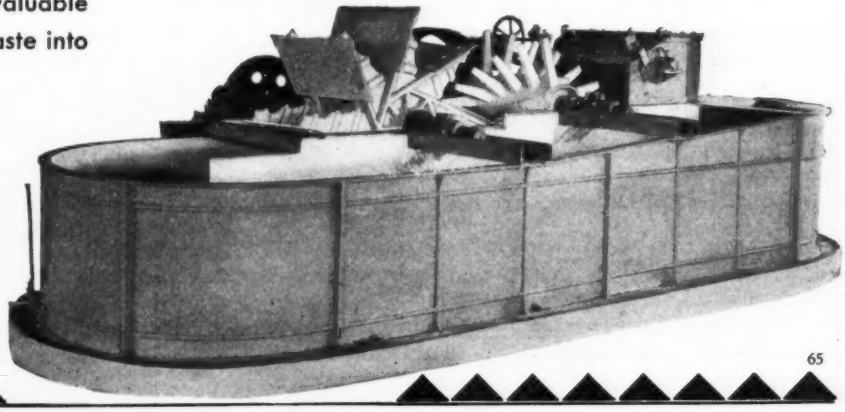
The Improved Pulper is a valuable asset to *any* mill. It turns waste into profit, reduces overhead, steps up production. Converts broke and trimmings into pulp ready for the chest, without mutilating the fibers. Quickly repulps bulky books, roll butts, entire laps, board trim and many types of materials ordinarily wasted.

Operates on batch or continuous system; both furnish and extraction can be entirely automatic. Enormous capacity. Clogging is impossible.

Our new descriptive booklet tells the full story,—write for it.

NOBLE & WOOD MACHINE COMPANY
Hoosick Falls New York

The same conditions have effected interesting reductions in our complete line of Jordans and Beaters. Write for details.



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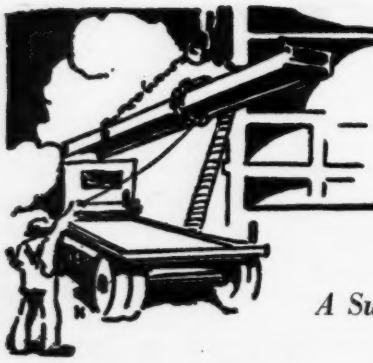


CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Bogalusa, La.—The Bogalusa Paper Company has completed plans and will proceed with erection of a new one-story addition, 72 x 82 feet, structural steel frame type, for which a general contract has been awarded to H. J. Cowgill, Bogalusa. Estimated cost has not been announced. A. Suter is company construction engineer, in charge.

Chelmsford, Mass.—The Oswego Falls Corporation, Fulton, N. Y., has concluded negotiations for the purchase of the plant and business of the Kadix Cup Corporation, Chelmsford, manufacturer of paper drinking cups and kindred containers. The purchasing company will consolidate with its organization and is said to be planning an expansion program. It is understood that the plant at Chelmsford will be continued at that location and operated as a branch.

Niagara Falls, N. Y.—The Twin City Paper Specialties Corporation has been organized by Adelbert M. Hinkson, 473 Third street, and associates, with capital of $16,000, to operate a local plant for the manufacture of paper products of various kinds. Nelson H. Jackson, 550 20th street, Niagara Falls, is interested in the new organization.

Fort Worth, Tex.—The Magnolia Paper Company, 601 East Second street, is said to have plans under way for a new addition to its plant on adjoining site, consisting of a one-story structure, 100 x 100 ft., to cost close to $80,000, with equipment. It will be used for increased capacity. A. G. Schroer is general manager, in charge.

Providence, R. I.—The Jencks Paper Box Manufacturing Company, Providence, has been formed under state laws with a capital of $300,000, to take over and expand the Jencks Paper Box Company, with local plant at 45 Waldo Street. Incorporators of the new organization include Herbert Tilmann and F. W. Conlan, Providence.

Appleton, Wis.—It was incorrectly stated in the issue of February 26 that the Riverside Paper Corporation of this place had purchased certain machinery formerly used at the plant of the Union Paper Mill Company at Monongahela, Pa. The machinery, it was reported, was sold to a company with a similar name, located elsewhere, causing the confusion. None of this machinery was purchased by the Riverside Paper Corporation.

Plainwell, Mich.—The Michigan Paper Company, Plainwell, has completed the construction of a new power plant at its local mill, with installation of improved type boiler units and auxiliary equipment. The unit has been placed in service and will provide increased efficiency in the power department at the mill.

Kimberly, Wis.—The Kimberly-Clark Corporation has arranged for an additional bond issue to total $3,500,000, a portion of the fund to be used for general financing and operations. The company has completed plans for the construction of a new acid plant at its Kimberly mill, consisting of a one-story and basement structure, 57 x 120 feet. No decision has as yet been made regarding time of erection, and it is understood that this may be deferred for a number of weeks.

Rosslyn, Va.—Fire recently damaged a portion of the plant of the Washington Paper Stock Company, Inc., with loss estimated at $10,000. It is planned to replace the damage at an early date.

Trenton, N. J.—The Stacy Paper Box Company, Inc., has been formed under state laws with a capital of $125,000, to manufacture paper boxes and containers. The company will take over and succeed to the organization of the same name, with local plant at Ewing and Ogden Streets. The incorporators of the new company include Frank Dee and Samuel G. Albert.

Philadelphia, Pa.—The Atlas Shopping Bag Company, 231 South Second street, has leased space on the fourth floor of the building at Thirteenth and Hamilton streets, and will occupy the plant for the manufacture of paper bag and containers for shopping and other service. Present works will be removed to new location and capacity increased. Aaron Toll heads the company.

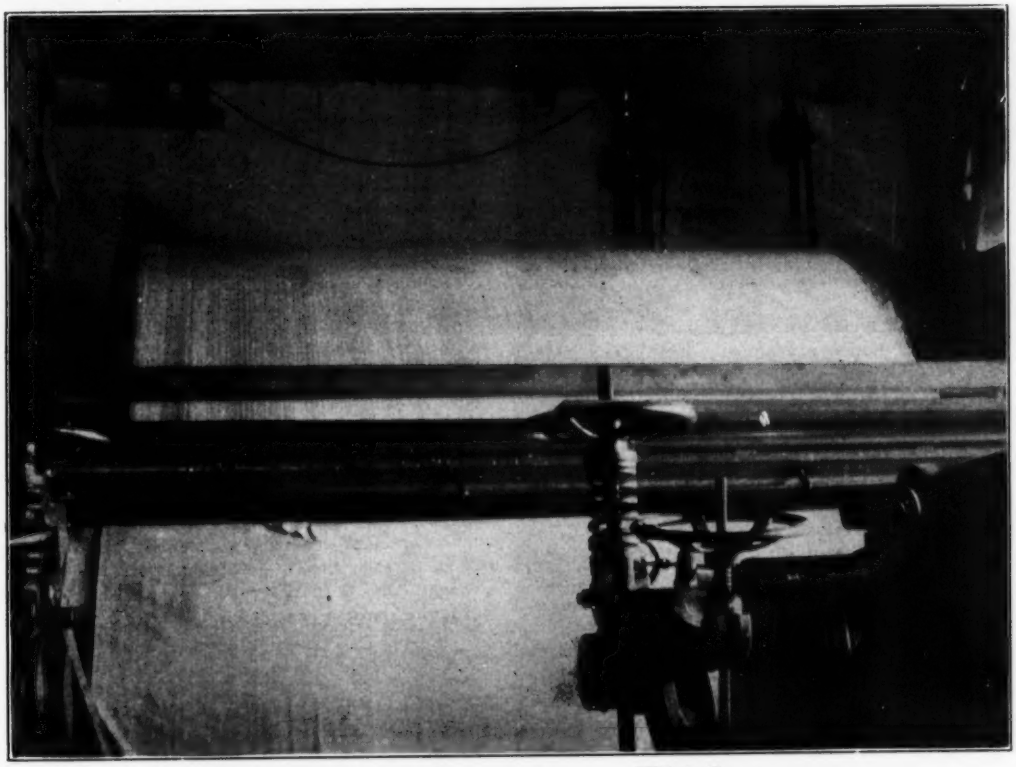
Richmond, Va.—The du Pont Cellophane Company, Buffalo, N. Y., is rapidly advancing production at its new mill at Richmond, originally placed in service last fall. At the beginning of the year, the mill was running on a basis of about one-third of maximum output and this has been advanced to approximately three-quarters of full production at the present time. It is expected to develop maximum capacity in the near future, as fast as workers are trained. The company has added to the working force at the mill and is said to have orders on hand to insure full output for some months to come. The Richmond plant represents an investment of close to $4,000,000. The company is a subsidiary of E. I. duPont deNemours & Co., Wilmington, Del.

International Falls, Minn.—Receivers for the Minnesota & Ontario Paper Company, International Falls, including Edward W. Backus, Edward W. Decker and Charles R. Fowler, have been ordered to issue receivers' certificates, payable in six months, and to sell them to the International Lumber Company, one of the subsidiaries of the Backus organization. The proceeds will be used in connection with operations at the plant.

Miami, Fla.—The Padgett Sanitary Drinking Cup Company, Miami, recently formed by W. E. Clark, 1014 N. W. 22nd street, Miami, and associates, is said to be planning the operation of a local plant for the production of paper drinking cups and kindred containers. Mr. Clark will be one of the heads of the company.

Cleveland, Ohio—The Industrial Rayon Corporation, West 98th street and Walford avenue, is said to have engaged Christian, Schwarzenberg & Gaede, 1836 Euclid avenue, Cleveland, architects and engineers, to prepare preliminary plans for its

IN THE PAPER INDUSTRY



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MACHINENFABRIK IMPERIAL
G. M. B. H.
MEISSEN, GERMANY

proposed new mill addition to be used for the manufacture of a transparent viscose wrapping material. As now projected, the new unit will be one-story, and is reported to cost more than $100,000, with machinery. Hiram S. Rivitz is president.

Richmond, Va.—The American Paper Company, Inc., 602 North 17th street, has arranged for an increase in capital from $50,000 to $100,000 for expansion.

Willsboro, N. Y.—The New York & Pennsylvania Company, Inc., 230 Park avenue, New York, has resumed operations at its local Champlain Mills, following a shut down since last fall. Employment will be given to a full working quota of 200 persons, as well as an extra night shift, until further notice.

Maynard, Mass.—The Cellulose Products Company, an interest of the American Powder Company, Maynard, is arranging plans for a reorganization, including the formation of a new company to take over the present concern. It is proposed to provide additional working capital to allow for an expansion and development program.

Westport, Conn.—The Westport Paper Company, Westport, has filed a preliminary notice of company dissolution under state laws.

New Incorporations

Chicago, Ill.—The School Tablet Corporation, 1131 West Roosevelt Road, has been incorporated with a capital of $10,000, to manufacture and deal in paper products of various kinds. The principal incorporators are Harry L. and Mandel Yale.

New York, N. Y.—The Greater City Paper and Twine Company, Inc., has been incorporated with a capital of 100 shares of stock, no par value, to deal in paper products. The company will be represented by Benjamin Eisenstadt, 1440 Broadway, New York, attorney.

New York, N. Y.—The Romm-Baigel Paper Corporation has been incorporated with a capital of $10,000, to deal in paper products of various kinds. The incorporators are Louis Loevi and Samuel Zimmerman. The company will be represented by Hyman Mates, 291 Broadway, New York.

To Increase Electrification

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., March 17, 1931.—The American Writing Paper Company Inc., is to spend about $100,000 in the further use of electricity for the units in its various paper mill plants here. Sidney L. Willson previous to leaving for Cuba last week gave a brief announcement to that effect but details were not given.

It is understood that the plan is to use electricity to take the place of surplus water power now used by the divisions of the company to some extent. The earlier mills have what is known as "indentured power" that went with the mill site and which is not to be changed.

The heavier machinery and that requiring much power will not be changed it is stated. For the lighter work electricity will be employed. Some 7,000 horsepower in small units will be made use of to this end. Electrical power can be obtained from the city of Holyoke or from the Holyoke Water Power Company both of which have large power generating plants.

The company already has a number of individual motors in its mills and the plan in reality is only an enlargement of the number now in use so far as can be learned.

New York & Penn. Resumes at Willsboro

[FROM OUR REGULAR CORRESPONDENT]

WILLSBORO, N. Y., March 9, 1931.—The New York & Pennsylvania Company resumed operations this week after being shut down since last fall. The company announced that a full force of about 200 hands would be employed steadily with prospects of adding to this number in the near future. A night shift will also be employed in taking care of the increased volume of orders.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 16, 1931.—A Style and Design Clinic, which included wall paper, was held at the Boston Art Club Tuesday evening under the auspices of the Associated Industries of Massachusetts in connection with Art Week in Boston, March 8-14, sponsored by the Committee on Industrial and Civic Art of the Boston Chamber of Commerce. Six designs exhibited, made by the Boston University Art School, were discussed for the manufacturer by W. B. Dailey, of the Thomas Strahan Company, Chelsea, Mass.; for the retailer by Miss Carolina L. Dewing of the Henry Bosch Company, and for the industrial artist by Abbott Kimball, of Lyddon, Hanford & Kimball, Inc., New York.

At the same meeting, J. V. R. Shepard, of the Cambridge Paper Box Company, discussed for the manufacturer designs on six candy boxes shown under the subject of packaging. The designs were made by the Massachusetts School of Art. E. H. Savage, of W. F. Schrafft & Sons Corp., discussed the designs for the distributor and Mr. Kimball for the industrial artist.

At the recent annual meeting of Carter, Rice & Co. Corp. Charles H. Beckwith, manager of the Pacific Coast house of the company, with headquarters at San Francisco, was elected a director of the corporation.

The Century Paper Company, Inc., represented by James F. Halloran, has announced the removal of its offices, as of March 21, to larger and more conveniently located quarters in the United Shoe Machinery Building, 140 Federal street. The new telephone numbers are Hubbard 3325 - 3326 - 3327. The company has been located for some time at 146 Summer street.

Knight, Allen & Clark, Inc., have taken on the agency for Martin Cantine's coated papers and will carry a stock of their lines.

M. Lincoln Simpson has become associated with the sales force of Knight, Allen & Clark.

A senior sales meeting of Storrs & Bement Company is to be held Friday evening at the office of the company.

A. L. Gooch, vice-president of Stimpson & Co., Inc., who has been ill since the latter part of December is getting on well and able to walk a little. He is at the sanitarium of the New England Sanitarium and Hospital, Melrose, Mass.

A. M. Bartlett, secretary of Stimpson & Co., who had been ill since the middle of November, is able to come to the office two days a week for two hours a day.

Grellet Collins, president of Dill & Collins Company, called on the trade last week.

The Jencks Paper Box Manufacturing Company, Providence, R. I., has been incorporated with a capitalization of $300,000; 25,000 shares common and 5,000 shares preferred stock, $10 each. The incorporators are Herbert Tillman, Providence; Ada M. Huntrods and Francis W. Conland.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 18, 1931.—The Government Printing Office has received the following bids for 116,000 pounds of No. 2 quality binders board; Consolidated Paper Company, at 3.375 cents per pound; Dobler & Mudge, 3.45 cents; R. P. Andrews Paper Company, 3.45 cents; Barton, Duer & Koch Paper Company, 3.45 cents; and Mathers-Lamm Paper Company, 3.275 cents.

For 1,100 sheets of 20 x 25 green gummed paper; The Whitaker Paper Company, at $17.40 per M sheets; Virginia Paper Company, $15.00; Mathers-Lamm Paper Company, $15.60; and R. P. Andrews Paper Company, $18.00.

Goes With Butler Dearden Paper Service

[FROM OUR REGULAR CORRESPONDENT]

HARTFORD, Conn., March 16, 1931.—R. F. Dutcher, auditor and credit manager of the Rourke Eno Paper Company for the past five years, has resigned his position to become associated with the Butler Dearden Paper Service of Worcester, Mass.

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LOCKWOOD'S DIRECTORY

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PAPER & ALLIED TRADES

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The 56th Consecutive Annual Edition

THE OLDEST INDUSTRIAL DIRECTORY IN THE UNITED STATES

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Classified List of Pulp Mill Products
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Envelope Manufacturers
Glazed and Coated Paper Manufacturers
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POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by **Reginald Trautschold Consulting Engineer**

Draft Control for Modern Boilers — Steam Demands Govern Fuel and Air Supplies

A suitable steam supply exactly balanced to the steam demands represents, obviously, the ideal condition in the operation of any boiler plant, whether the steam is required for power or process purposes. Economy and safety, furthermore, both favor some practical synchronizing of the rates of steam generation and of steam utilization. All of which necessitates a suitable balance being effected between the fuel and combustion air supplied to the boiler furnace. This desirable balance varies, however, not only with the demands for steam, but with the rate of steam generation, quality of fuel, etc., so that continual adjustments are required to maintain the best fuel-air ratio.

The trends toward much higher steam pressures and more rapid steaming, which characterize the modern boiler plant, have made this problem of combustion control, and particularly of draft control, a consideration of very decided moment in reducing power and steam costs in the steam plants serving pulp and paper mills. Basically, the problem is very much the same, but its economical solution differs considerably, being complicated by the quality and kind of fuel and by the differing excess air requirements for desired combustion efficiency and most economical overall operation.

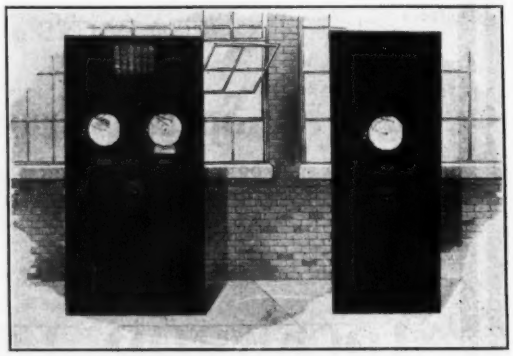
The fuel may be coal, oil or gas, or a mixture of fuels, but in any case the fuel and air must be supplied in proportion to the demand for steam and the air or the fuel regulated in accordance with the excess of air being used. Where fuel is burned in solid form, as on stoker grates, the regulation is of necessity largely a problem of supplying the air in proportion to the steam requirements, a uniform fuel bed of proper thickness being maintained over the entire grate area. When burning coal in pulverized form, vaporized oil, or other fuel in gaseous form, the problem is to supply both air and fuel, intimately mixed, simultaneously and in the proper proportions to meet the local and maintain the desired relationship between fuel and air for best efficiency.

With stoker fired boilers, it may be desirable to carry higher excess combustion air at low ratings than at normal and high rates of boiler operation. Also, when the fuel is fired in pulverized form or in a gaseous mixture, another complication is often introduced, for it may be necessary to carry considerably higher excess air at high ratings, in order to hold the furnace temperature down, thereby preserving brick work and furnace linings. Such regulation necessitates the manipulation of various dampers, control of fan speeds, variations in rate of fuel feed, etc., adjustments which for the sensitive regulation demanded nowadays should be made, not only simultaneously, but practically instantaneously.

Any approach to accuracy in such regulation necessitates, of course, a full complement of indicating and recording instruments; for the determination of pressures, temperatures, flow of air and steam at critical points, etc.; to provide informative guidance in the manipulations of the various control switches, pilot motors and control drives, which have also to be provided, for the regulation of the fuel, forced draft and induced draft supplies. All these instruments and control mechanisms should be centrally located, furthermore, for some system of remote control only is feasible, it being impractical to employ a crew of operators at different points to manipulate the several controls at one and the same time.

Bringing the controls necessary for the regulation of the remotely located pilot motor units and control mechanisms to a central point, not only enables an operator at the control panel to make all the necessary adjustments to secure the desired results by "push button" manipulation promptly, as indicated by the instrument findings recorded on the panel board, but also makes feasible a fully automatic system of control, one which functions instantly and as a unit. This is customarily effected by introducing automatic contacts to regulate the pilot motor drives in accordance with the movement of recorders which respond sensitively to variations in the conditions which have to be regulated to effect the desired control.

It is not the intention to enlarge to any extent upon the constructional details of the control mechanisms nor to elaborate upon the principles underlying the operation of various approved systems automatic combustion control, but simply to point out a few salient facts concerning the performance of such systems. It will suffice to state that the master control is customarily ex-

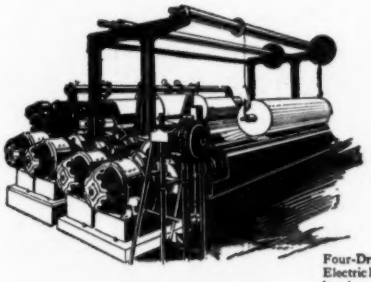


Courtesy: Bailey Meter Co.

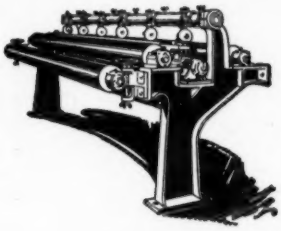
FIG. 1

Individual boiler and master control panels in the boiler room at the Jno. H. Heald Co.

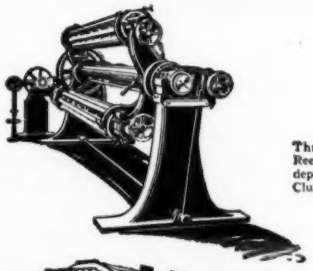
PAPER MAKING MACHINERY



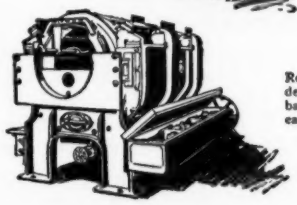
Four-Drum Winder with Electric Drive. Controls roll hardness automatically.



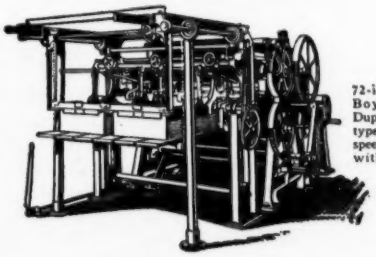
Ball Bearing Slitter Part. Quick-removable top and bottom blades give greater production with less waste.



Three-Drum Revolving Reel. Each drum has independent M&W Friction Clutch drive.



Rotary Screen, with divided diaphragms giving balanced movement and easy flow.



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ercised by any slight drop or rise in the pressure of the generated steam, i.e., the operating pressure of the boiler or plant, while the relationship between the fuel and air supplied to the individual boiler furnace is modified continuously to secure the best combustion efficiency. A typical example or two will illustrate how this is accomplished in certain approved systems of automatic combustion control.

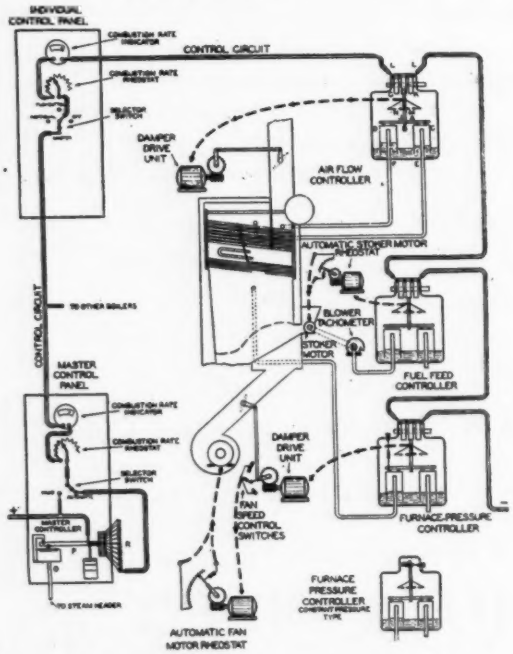
Combustion Control at the Jno. H. Heald Company[1]

"At the Lynchburg, Va., plant of the Jno. H. Heald Company, the complement of metering and control equipment essential for correct remote, push button, control consists of a steam pressure recorder; boiler meter to indicate, record and integrate steam flow and to record air flow and flue gas temperature; temperature recorder for preheater temperatures; multi-pointer gauge for drafts and pressures; control switch, and pilot motor control located so as to regulate properly the fuel, forced draft and induced draft supplies. In this case, complete automatic control has been attained for the regulation of the boiler's output in accordance with the demand, with insurance of correct efficiency, by the inclusion of the proper contact making devices in the master pressure recorder and in the boiler meter.

"A close up view of the master and one of the individual boiler panels at the Lynchburg plant shows, in addition to the master pressure recorder and contractor on the master panel, a drum switch having two positions, by which either push button or automatic control of the fuel and air supplies to the three 1,044 horsepower, pulverized coal fired, boilers may be effected. in accordance with the demand as indicated by variations in steam pressure. The drum switch on the individual boiler panel permits push button control of forced draft, induced draft and the fuel at this boiler, separately or together and further permits partial or complete automatic control from the master, depending upon the position to which the switch is turned.

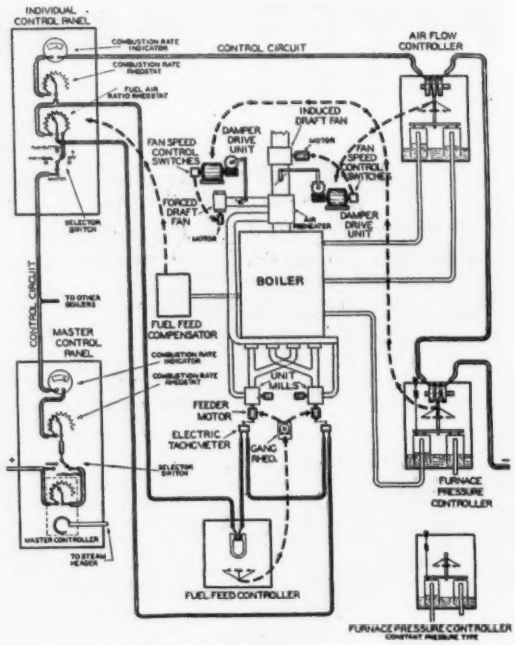
"The primary factor governing this combustion control is steam pressure measured at a selected point in the main steam header, and taken as an indication of steam demand. A master

[1] H. E. Weaver, Bailey Meter Company.



Courtesy: Leeds & Northrup Co.

FIG. 2
Typical diagrammatic assemblage of combustion control devices for a stoker fired boiler furnace.



Courtesy: Leeds & Northrup Co.

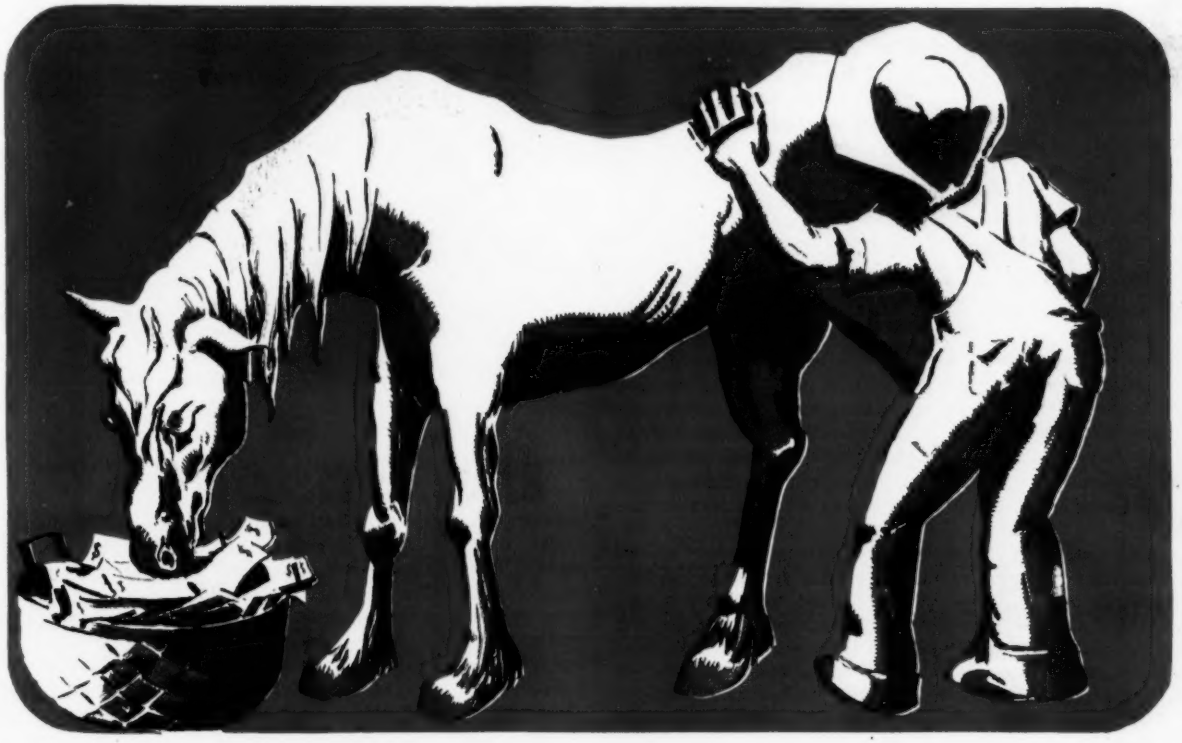
FIG. 3
Typical diagrammatic assemblage of combustion control devices for powdered coal fired boiler furnace.

contactor sends out electrical impulses for "more" or "less" fuel and air for all boilers connected to the master panel and makes the necessary changes for maintaining the steam pressure at the desired operating point.

"It is a known fact, however, that increasing and decreasing the fuel and air supplies together will not give the desired efficiency or desired furnace pressure throughout the full range of control operation, since the characteristics of the individual factors entailed are inherently different. Accordingly, the relation between the steam flow and air flow records of the boiler meter (a recognized direct indicator of combustion efficiency) at each boiler is used to operate an additional contactor, which sends out electrical impulses to correct the induced draft of the particular boiler as required to maintain the desired fuel-air ratio, and, consequently, the desired combustion efficiency as well. Readjustment of the forced draft is made through another contactor operated from a furnace draft mechanism.

"The control drives which receive the impulses from the push button stations and the contactors consist essentially of continuously running fractional horsepower motors with gear reduction. The control drives are also provided with interlocks, travel limits, special time limits and other safety features, together with position indicators and handwheels. The motor and driving pinion are located outside of the drive proper and may be removed and replaced, if necessary, at a minute's notice.

"More recent installations of control equipment have been made at the Mead Straw Pulp Company, Chillicothe, Ohio; Munising Paper Company, Munising, Mich.; and at the Maine Seaboard Paper Company, at Bucksport, Me. At the Munising plant, complete automatic combustion control has been placed in operation on one 1,258 horsepower boiler equipped with water-cooled furnace walls, as well as with an air preheater and an economizer. This boiler is fired on pulverized coal, using unit mills. The fuel supply is controlled by regulation of the feeder motor speed and, as in the case of the John Heald installation, the supply of primary air to the mill is controlled in parallel with the fuel. The speed of the two induced draft fans is regulated by a valve installed in the steam line common to



There's No Use Pampering It...

There's many a machine in the industry that "ain't what it used to be". All the pampering and coddling in the world won't enable such machines, designed to meet the demands and ideas of twenty or forty years ago, to meet the demands and ideas of today. Especially with the added burden of those twenty or forty years of wear and tear.

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58

the fan turbines. The speed of the one forced draft fan is also regulated through the operation of a control valve in the turbine supply line.

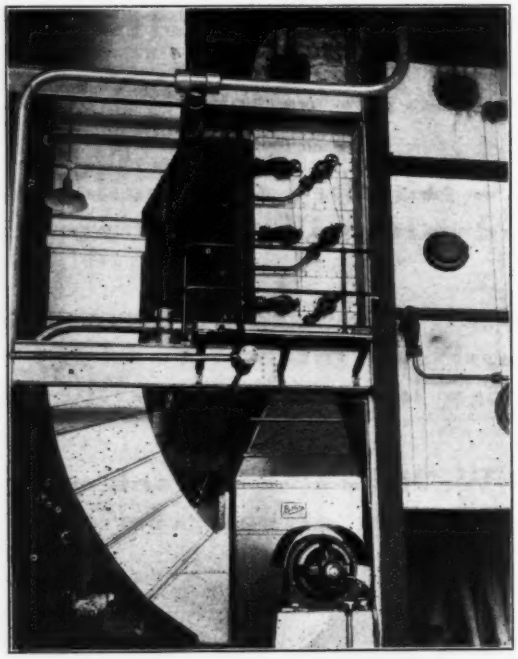
"At the Main Seaboard Company's installation, three 637 horsepower, water tube, boilers, equipped with water-cooled furnace walls and air heaters are fired on fuel oil. The fuel supply in this case is regulated by operating a control valve in the oil line. Regulation of the forced and induced drafts, since both the forced and induced draft fans are driven by constant speed motors, is obtained through the operation of dampers."

Two New England Mills Adopt Automatic Control

At the present time, combustion control equipment is being installed in the power plants serving two paper mills in New England which employs a somewhat different principle of operation, particularly as regards the method of correcting the fuel-air ratio for variations imposed by vacillations in combustion requirements. In these cases, the carbon dioxide content of the flue gases serves as an index of the actual combustion efficiencies of the boilers and is utilized for guidance in the regulation of the fuel-feeder speed, thereby maintaining a satisfactory fuel-air ratio,

Diagrammatic assemblages of the instrument and control hook-ups for combustion regulation by this system of combustion control, in stoker fired and powdered fuel furnaces, are illustrated and, while the regulatory functions with stoker and pulverized coal firing are performed by different types of devices, these need hardly be featured in a general discussion of this nature. A few remarks concerning the installations being made at the New England plants, both of which are fired on pulverized coal, may be presented to advantage, however, since it is the sensitive combustion control of the pulverized coal firing of steam boilers which is at the present time of the more general interest.

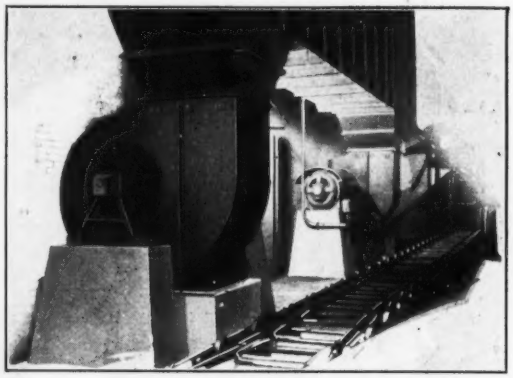
Each of the plants in question operates a battery or two boilers, each boiler fired by two unit coal pulverizers. The coal to each of the pulverizers is supplied by a fuel-feeder driven by a



Courtesy: Buffalo Forge Co.

FIG. 5

Induced draft fan in combustion control system at the plant of the Rhinelander Paper Co.



Courtesy: Buffalo Forge Co.

FIG. 4

Forced draft fan in combustion control system at the plant of the Rhinelander Paper Co., Rhinelander, Wis.

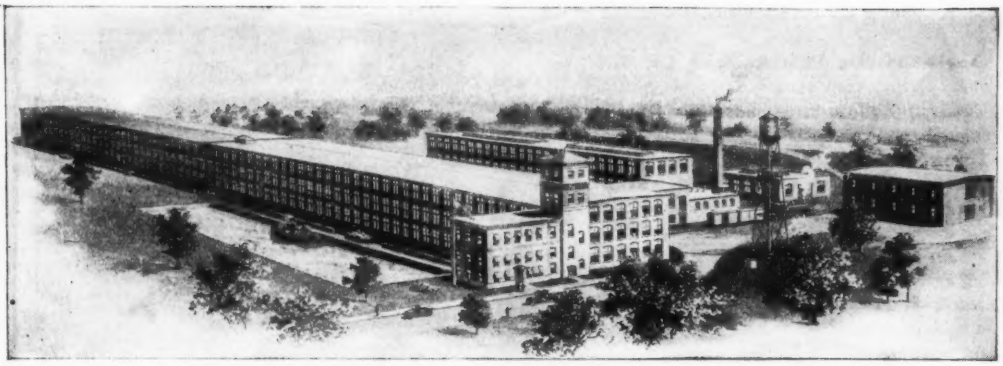
variable speed, direct current, motor and regulation of the rate of fuel feed is secured through a motor operated gang field rheostat for the two feeder motors at a boiler. Forced draft is supplied each boiler by a fan, driven in one case by a variable speed slip-ring motor regulated by a motor operated from controller, and in the other by a variable speed steam turbine. Close regulation of the forced draft is provided for each boiler by dampers in the forced draft duct, while the induced draft is obtained for each boiler by a fan driven by a variable speed slip-ring motor, the regulation of which is effected by means of on uptake damper.

The principle of operation is to vary a master electric control current automatically and in response to changes in load, or pressure, the regulation of the master current being effected through the use of a master controller responsive to header steam pressure. Air flow at each boiler is held in constant ratio to the control current by an air-flow controller acting upon the uptake damper drive unit. Acting in conjunction with this draft control is a furnace-pressure controller which adjusts the forced draft damper so as to provide a constant furnace pressure. Fan speeds are changed as required by fan speed control switches mounted on the corresponding damper drive unit, while a fuel-feed controller operates in a manner similar to the air-flow controller, to maintain a definite relation between the control current and the feeder speed by acting upon the feeder motor gang rheostat.

In addition to these fuel-feed and air-flow controls, compensators are provided for adjusting the fuel feed automatically to variations and irregularities in fuel and air ratio requirements, by means of a CO_2 recorder controller. By virtue of this refinement, a practically uniform CO_2 content in flue gas is maintained, in spite of rapidly varying load demands.

The control of the entire battery may be under full automatic regulation, under push button control or of a combination of automatic and manual control, the operator readily changing from one type of control to the other by simply throwing a selector switch. The mill load for power and process steam can also be distributed between the boilers as desired and the distribution maintained automatically. Either boiler unit can also be controlled automatically to operate at constant ratings and the other employed for the accommodation of the swings in steam demand.

This particular system of combustion control is also provided with protective and alarm features which add considerably to the convenience and safety peculiarities of the control. If the control power, or current, should fail, for instance, causing the controllers and drive units to become inoperative, an alarm would be sounded, calling the attention of the operator to the trouble,



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Look to Albany for improved felt efficiency. And if you have a problem that is bothering you, we suggest that arrangements be made through us or our representatives to have one of our service engineers look the situation over.

Albany Felt Company

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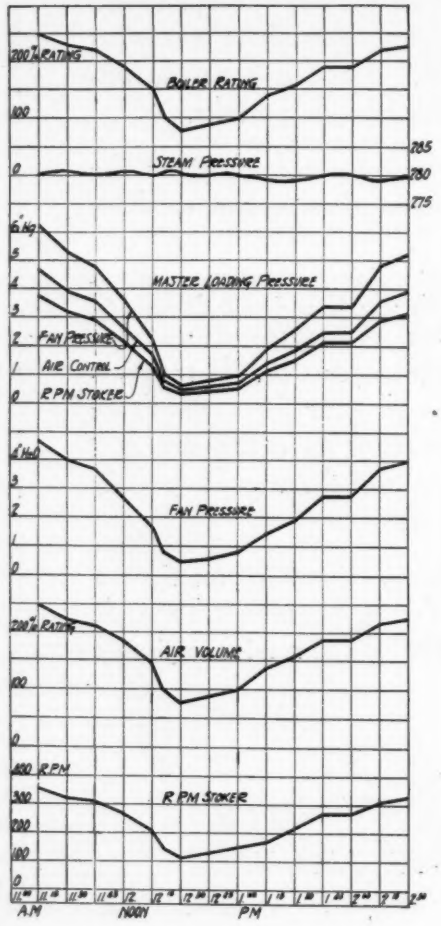
and an annunciator would indicate on which boiler the mishap had occurred.

At the Anglo-Canadian Pulp & Paper Co., Ltd.

At the new plant of the Anglo-Canadian Pulp & Paper Company, Ltd., at Limoleu, the four large boilers, fired by underfeed stokers, are equipped with a flexible system of automatic combustion control which is reported to be giving excellent satisfaction. The various boiler units are equipped with individual forced and induced draft fans driven by constant speed motors, each fan having two speeds. The control consists of three regulators per boiler, one regulator controlling the stoker speed, another operating the forced draft damper and the third manipulating the induced draft damper. Both of the damper regulators also control the speeds of their respective fan motors, so as to provide sufficient suction or pressure to maintain the damper regulators in operating range. The individual regulators of each boiler are in turn controlled by a station master controller, which operates from the steam drum pressure.

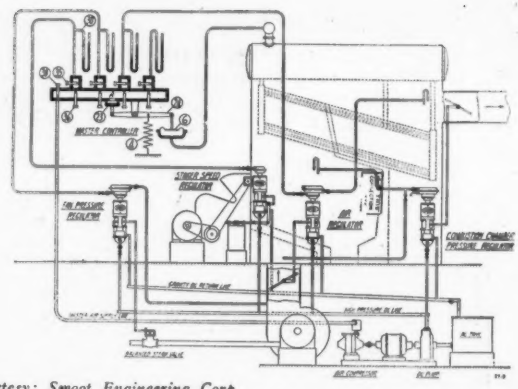
The variations in the load demands which cause changes in the momentary steam pressure are converted in the master controller into air loading pressures which are utilized to operate the individual regulators on each of the boilers. Provision is also made at the master controller to operate any boiler under constant rating conditions, varying rating to maintain the steam pressure, any desired excess air on the different boilers or varying rating. The flexibility of operation insures the ability of the boiler plant to generate steam in accordance with the load demands, regardless of the severity of the load changes.



Courtesy: Smoot Engineering Corp.

FIG. 7

Curves depicting operating results secured over a period of marked load change.



Courtesy: Smoot Engineering Corp.

FIG. 6

Typical boiler layout of automatic combustion control for stoker fired boiler furnace.

The sensitiveness of regulation is well indicated by the curves depicting the operating results secured over a period of marked load change, steam generation falling from that of 250 per cent. of boiler rating to that of 80 per cent. and then returning to a high value. During this marked fluctuation in steam demand, it will be noted that the main steam pressure varied very little, only enough to operate the master controller, but that the air volume and fuel feed adjustments were marked. The coordination of the controlling factors is such, in fact, that the best proportions of fuel and air are accurately maintained at all times during the fluctuations in demand.

10 to 15 Per Cent Betterment in Boiler Efficiency

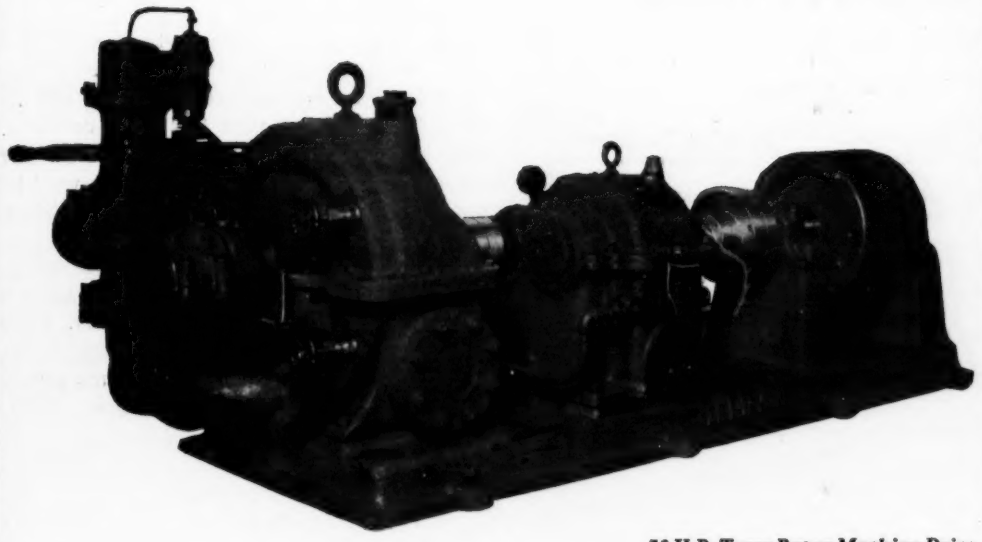
Just what is the value of these and other approved systems of automatic combustion control can be brought out best, perhaps, by the citation of general rather than specific service records. Such appraisal should furnish some dependable measure, at least, of the economy which may fairly be anticipated by any mill contemplating changing over from manual to automatic control in the operation of its boiler plant.

Experienced crews have secured boiler efficiencies with hand control of around 79 or 80 per cent. for periods of several weeks in a few isolated cases, it is true, but the practical operating figures of even the best run plants show that the attainment of efficiencies above 75 per cent. with manual combustion control is decidedly the exception, while from 72 to 73 per cent. efficiency indicates highly creditable operating results. The average is considerably lower, according to dependable statistics, about 70 per cent. This, of course, without taking into account possible economies attributable to the use of economizers for the reclamation of flue heat.

Monthly data covering results secured with automatic combustion control installed in a number of boiler plants, built fifteen to twenty years ago with a multiplicity of boiler units, prove that in each such relatively old-style plants the attainment of boiler efficiencies of 76 or 77 per cent. can be considered normal achievements. In more modern plants, monthly efficiencies (stoker, furnaces, superheater and boiler) of 78 to 80 per cent. will be the average, while the best of them will show considerably better results with automatic combustion control.

As the fuel item makes up over 75 per cent. of the net cost of power or steam, these economies unquestionably represent highly desirable savings during the operating year and well warrant the investment entailed for a modernizing of the combustion control. Feed water regulation and control also offer opportunities of effecting substantial reductions in steam costs and this phase of boiler plant operation will be taken up in some detail in the next discussion.

TERRY
Paper Machine Drive



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FOREIGN PAPER TRADE

January exports of paper and paper products amounted to $2,050,612, compared with $3,144,535 a year ago, or a decrease of 34 per cent, but this represented, however, an increase of 3 per cent over the preceding month's record, according to the Paper Division of the Department of Commerce. Exports of greaseproof and waterproof papers gained 92 per cent and wall paper 21 per cent compared with January, 1930. These items, however, comprise the only notable gains. Very slight increases were recorded by cash register and adding machine rolls, paper bags, wall board of paper or pulp, toilet paper and overissues and old newspapers, compared with the corresponding month last year.

The following heavy losses took place, compared with January, 1930: Book paper, not coated, 66 per cent; news print, 52 per cent; fancy writing paper, 58 per cent; box board (paper board and straw board), 54 per cent; wrapping paper, 50 per cent; other paper boards, 46 per cent; bristol and bristol board, 43 per cent; tissue paper, 45 per cent; other writing paper, 40 per cent; surface coated papers, 35 per cent; paper towels and napkins, 30 per cent; fiber insulating board or lath, 30 per cent; vulcanized fiber sheets, strips, rods and tubes, 33 per cent; envelopes, 28 per cent; blotting paper, 25 per cent; sheathing and building paper, and wall paper, each 21 per cent; while smaller losses occurred in cover paper, filing folders, index cards and other office forms, boxes and cartons.

The outlook, however, was more encouraging when compared with the preceding month's record and the following heavy gains are noted: Surface coated papers, 103 per cent; wall paper, 78 per cent; toilet paper, 62 per cent; news print, 34 per cent; box board (paper board and straw board), 46 per cent; cash register and adding machine rolls and greaseproof and waterproof papers, each 30 per cent; paper towels and napkins, 35 per cent; and cover paper, 20 per cent.

There were smaller increases in fiber insulating lath or board, wall board of paper or pulp, other paper board, sheathing and building paper and paper bags.

The heaviest losses, compared with December, 1930, were as follows: Fancy writing paper, 44 per cent; overissue and old newspapers, 28 per cent; blotting paper, 23 per cent; book paper, 19 per cent; filing folders, index cards and other office forms, 18 per cent; other writing paper, 13 per cent; envelopes, 15 per cent; tissue and crepe papers, 16 per cent; and vulcanized fiber, sheets, strips, rods and tubes, 10 per cent.

Total exports of paper base stocks were valued at $157,025, being a 55 per cent decrease over the corresponding month last year and a 16 per cent decrease as compared with the preceding month. Rags and other paper base stocks declined 54 per cent, compared with January, 1930, but were slightly higher compared with the preceding month. Exports of soda wood pulp declined from $27,790 in January, 1930, to $2,009, while sulphate wood pulp exports were 30 per cent lower than a year ago.

January imports of paper and paper products amounted to $10,784,264, as against $12,144,879 in the preceding month, and $13,350,144 in the corresponding month last year. Imports of news print declined approximately 13 per cent, both as compared with the corresponding month last year and the preceding month, amounting to, in January, $9,734,933. Imports of this commodity increased greatly from Germany and Norway and declined from Canada, Sweden and Finland. Imports of greaseproof and waterproof papers decreased 90 per cent, compared with January, 1930, but only very slightly as compared with December, 1930. Imports of the following declined 50 per cent or more, compared with January, 1930: Writing and drawing papers, kraft wrapping, writing paper and envelopes combinations, pulp board in rolls and duplex decalcomania, not printed.

There were no increases worthy of note. Compared with the preceding month, imports of the following commodities were considerably heavier: Kraft wrapping, other wrapping, pulp board in rolls, paper board, pulp board and card board, cigarette paper, cigarette books and covers, papier-mache and pulp manufactures.

Total imports of paper base stocks during the month under review were valued at $8,504,059, being a 25 per cent decline compared with January, 1930, and 10 per cent decline compared with the preceding month. Pulpwood imports totaled $670,031 as against $1,183,235 a year ago and $478,878 the preceding month. Imports of rough spruce declined 98 per cent, compared with the corresponding month last year, peeled spruce declined 48 per cent, but there was a moderate increase over the preceding month in the latter. Imports of rossed spruce increased, both as compared with a year ago and the preceding month.

Imports of rags for paper base stock declined very heavily, amounting to $783,429 in January, 1930, but only to $170,999 in January, this year. Imports of bleached sulphate pulp have increased greatly, amounting to $94,324 a year ago as against $384,905 during the month under review and $245,296 in December, 1930.

CHEMICAL ENGINEERING

Elements of Chemical Engineering, a new 625 page volume by Walter L. Badger and Warren L. McCabe has just been published by the McGraw-Hill Company, Inc., price $5.00. It may also be obtained through the book department of the Technical Association of the Pulp and Paper Industry, 370 Lexington avenue, New York.

This book will be welcomed in the pulp and paper industry since

it enables its engineers and chemists to study this new branch of engineering which is finding many points of application to this industry.

The authors are well known to the paper industry and W. L. McCabe, it will be recalled, together with W. H. Swanson of the Kimberly-Clark Corporation read a paper at the Technical Association meeting this year in New York, on the Paulson Acid Absorption System. Both Badger and McCabe are members of the chemical engineering staff of the University of Michigan.

There is an introduction to the book by Dr. Arthur D. Little, one of the first chemical engineers to serve the paper industry. In this he points out that the greatest developments in the chemical industries have taken place in the past thirty-five years. It is only recently that chemical engineering as a distinct profession has been recognized. It is not chemistry with a little engineering mixed in nor is it mechanical engineering with a smattering of chemistry but it is a definite branch of engineering, the basis of which is those unit operations such as drying, evaporating, distillation, transportation of liquids, size separation, etc. which, in their proper sequence, constitute a process as conducted on an industrial scale.

The chemical engineer must possess accurate knowledge of the chemical and physical properties of materials, the laws of heat flow, the properties of fluid films and he must have a theoretical knowledge and practical conception of the various types of equipment that may be used in the unit processes.

The book starts with a consideration of transportation of fluids which is largely descriptive and gives details relating to the use of various types of pumps, valves, pipes and fittings. The pictorial illustrations are excellent.

The mathematical treatment given is unusually good since it enables those who have not been using the calculus for a long time to understand the underlying theory of fluid films and other concepts that have become the basis of chemical engineering. Graphical integration is used in the solution of heat transfer problems involving temperature drops and overall coefficients varying along the length of a heat interchanging unit such as a drier section of a paper machine. The book contains many clearly worked out mathematical problems to illustrate the text.

For the pulp and paper industry this book appears at an opportune time since it is rapidly becoming a leading chemical engineering or process industry and through the leadership of TAPPI, attention is becoming focused on the ways in which its unit operations can be improved by the proper application of physics, mathematics and chemistry. In portraying the modern idea of chemical engineering Badger and McCabe's book should contribute to the industry's upbuilding.

Scandinavian Market More Hopeful

WASHINGTON, D. C., March 18, 1931.—The tone of the Scandinavian pulp and paper market is somewhat more hopeful, according to reports reaching here. In the sulphite market, although sales are small, prices are firmer, the program for curtailment of production in this branch of the industry being now under way. No change has taken place in the sulphate market, however, which continues to suffer from over production and weak prices. In the news print market the buyers apparently are still ordering only for immediate requirements, while in the sulphite and kraft wrapping paper markets a somewhat better demand is reported.

Timber Board Requests C. W. Boyce

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 18, 1931.—Request has been made of the American Paper and Pulp Association by the United States Timber Conservation Board, appointed by President Hoover, for the "loan" of Charles W. Boyce, secretary to act in an advisory capacity. It is reported that several of the prominent members of the Association are in favor of this "loan." The Board will have its second meeting sometime in April although the date has not yet been set.

The Advisory Committee of the Board which met recently has outlined a program consisting of the following:

1. Economic situation of forests and timber industries, including present and prospective timber supply; and present and prospective timber needs.
2. Privately owned timber, logging, manufacturing plants, and distributing facilities.
   a. Extent and character of timber ownership.
   b. Trends in timber values.
   c. Financial pressure for liquidation, especially in West.
   d. Small mill situation, especially in South.
   e. Producing capacities; operating efficiency; conditions of utilization.
3. Publicly owned timber.
   a. Extent and character of commercial timber under public ownership.
   b. Policies governing acquisition of timber and timber lands.
   c. Policies governing sale, cutting, and use.
   d. Revenues from National forests as timber conservation funds.
4. Economy, stabilization and diversification possible through centralized operations:
   a. In timber ownership, and production.
   b. In assembly and distribution of forest products.
5. Distribution and marketing methods; possibilities of diversification and expansion of markets and uses; and promulgation and/or methods of enforcement of standards for forest products.
6. Federal and State laws and policies in relation to timber conservation.
   a. Taxation.
   b. Other.
7. (a) Possible scope, method, and form of continuing public and private cooperation for timber conservation, stabilization of industry and security of employment, including—
   (b) Possible means of promoting economical perpetuation of forests and forest industries through sustained yield forest management, and otherwise.

Canadian Pulpwood Prices Decline

OGDENSBURG, N. Y., March 16, 1931.—It is reported that paper mills in this section relying on Canadian pulpwood are now obtaining it at the best price in several years. The decline in price has been made effective within the past few months and over-production in the market is cited as the cause and not the competition of the Russian product. With Canadian paper mills reducing their production to absorb the over-production of paper which has been demoralizing the market and lowering prices for some time past the timber cutters failed to decrease their harvest and the result has been that the pulpwood dealers have a considerable surplus at their terminals which cannot readily be disposed of. It is expected, however, that there will be a marked restriction in the cut this year in order to bring about a stabilization of the market. Paper manufacturers in Northern New York are now wondering whether or not it will be possible to obtain imported shipments of pulpwood this season in view of the ban recently placed by the government and the suggestion has been made that importers in this country should cooperate in the selection of a representative to go to Russia and certify each shipment.

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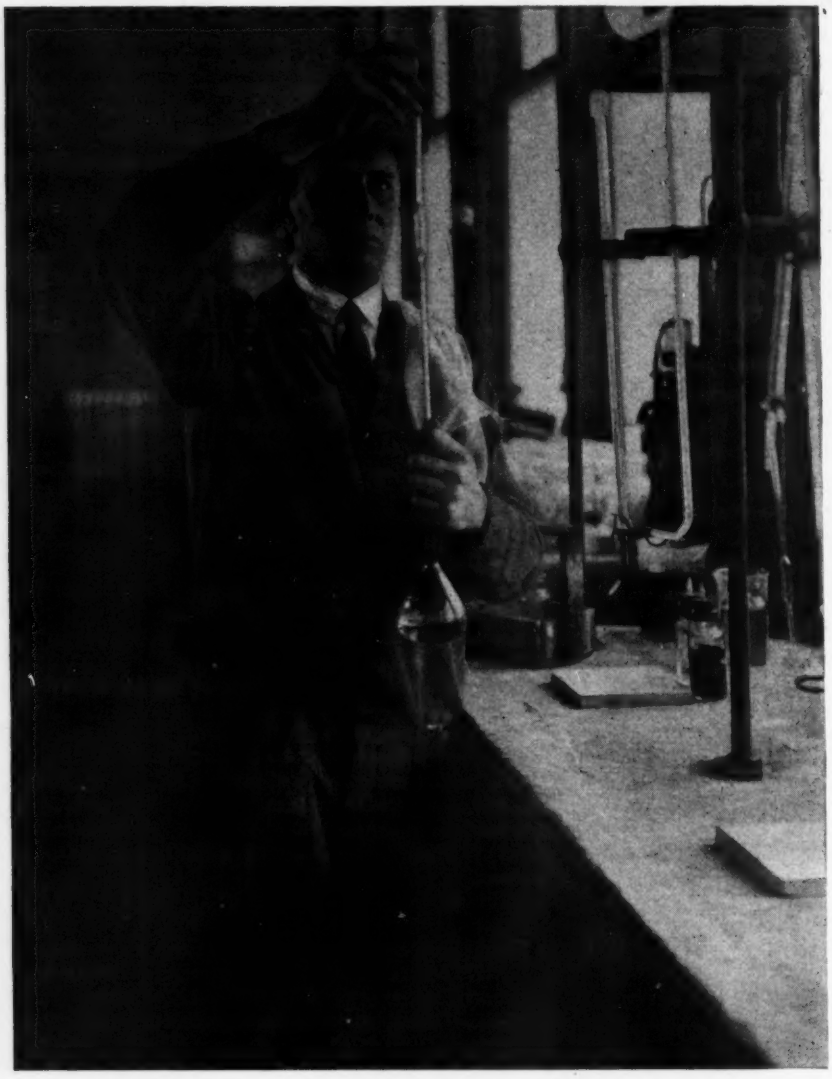

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Liquid Chlorine

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Western Hemlock

EVERETT, Wash., March 12, 1931.

DEAR MR. MACDONALD:

You will say, no doubt, that this question has been settled a long time and that there is no use wasting time on it again, and especially so since the recent publications of statements to the effect that "western pulps were entirely unsuitable" to the needs of mills making special or better grades of paper, but has it really been settled?

My answer is *NO.*

Naturally the paper maker is more interested in this question than the pulp maker, or at least he has been, up to quite recent times. However, today both are vitally interested in it, for the paper maker sees in it an ever increasing source of supply of the raw material to keep his machines running, and the pulp maker is flanked on one side by his ever increasing raw wood cost, due to longer hauls, and the gradually but surely diminishing supply and on the other side by the serious inroads this same Hemlock pulp is making on his sales.

I suppose you are still thinking that I have made statements about hemlock you tried that did not work out, but no, I am talking about the new hemlock pulps made from the hemlock of the Northwest—Western hemlock or *Tsuga Heterophylla.*

Most of you are entirely familiar with Eastern or Middle United States hemlock—*Tsuga Canadensis*—and are, no doubt, judging the Western hemlock on the same basis, but did you know that Western hemlock is entirely different?

For instance, everybody knows that Eastern spruce pulps easier and gives a better fiber than Eastern hemlock, but Western hemlock pulps easier than either Eastern spruce or hemlock. Further, the yield of Eastern spruce is greater than Eastern hemlock and again Western hemlock is greater than either of them.

And again we all know that Eastern hemlock does not make a suitable pulp for the rayon industries, while Western hemlock pulp is being sought for this purpose on account of its superior qualities.

You may ask, "For what grades of paper is Western hemlock pulp being used?" In reply let me say that Western hemlock is being used for all grades.

You find it in news, wrappings, manilas, drawings, towels, toilets, tissues, bonds, books, rotos, parchments, ledgers and specialties of many kinds. You will find it in many grades, hard, strong, soft, easy or hard bleaching and it can be made to fit into any furnish for any special or ordinary purpose.

You will never experience any pitch troubles on your machines with Western hemlock pulp for the quantity found is so small as to be hardly measureable.

You probably have thought that Western hemlock fiber is coarse and rough and fit only for the coarser grades of paper but nothing could be further from the truth as you can judge from the fact that at several plants this fiber is being screened with less than 2 plates per ton per 24 hours through 8 cut plates and in bleached fibre rescreening less than 1.5 plates per ton per 24 hours on a 7 cut plate is usual practice, and all this of a fine strong pulp that is being used in the grades previously mentioned.

There is, however, a fact that should be carefully considered when using Western hemlock pulps—it requires careful handling.

If you would maintain all those qualities that go to make a quality sheet—good fold and tear in the bonds and ledgers, opacity, feel, finish in other grades, softness in tissues and strength wherever it is needed—treat this pulp with consideration in your beaters and jordans, for it does not require as much nor as harsh a preparation as the Eastern pulps.

Many of you who use several pulps blended together in your higher grades will find that Western hemlock gives unusual characteristics with a surprisingly small percentage in the finish.

Western hemlock has been used in the paper industry on the Pacific Coast for nearly 40 years but to you of the East it is a new pulp and it must not be forgotten that every child must grow up to be an adult.

The pulp mills on the Pacific Coast have been until very recently only a part of a resident paper industry, but as your Eastern supplies have been dwindling this Western youngster has been growing and now that he has become an adult he can more than supply his own needs so he is offering you a source of supply for your machines that will not see an end in this generation.

Sincerely yours,
G. J. ARMBRUSTER, Sulphite Mill Superintendent,
Puget Sound Pulp and Timber Company

New Standards Data

A new compilation of data entitled, *Measurement Units and Standards,* is issued by the American Institute of Weights and Measures, 33 Rector street, New York, and a copy of this book may be obtained gratis by applying to the Institute, William E. Bullock, Secretary. In addition to the data on units and standards, the book contains an article recommending *timex* and *spacex* as names for the Einstein specialization of basic time and space. It also contains a useful description of the difference between a *unit* and a *standard,* prompted by the lack of unanimity existing in reference publications.

Riverside Paper Co. Incorporates

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 7, 1931.—The Riverside Paper Company of Tacoma, which was recently reported to have bought the machinery and equipment of the defunct mill of the Union Paper Company at Monongahela, Pa., has now filed incorporation papers with a capital stock of $125,000. Named in the incorporation are Anne P. McLean and Alfred E. Sannes.

Odor in Kraft Paper

SPECIAL INQUIRY No. 153

A member writes: "We would appreciate your sending out a questionnaire on the subject of odor in kraft paper as it has a great deal of interest, particularly where kraft paper is manufactured for bag conversion purposes.

"One solution of the problem is drying the paper on the machine to 5½ to 6 per cent moisture but this naturally makes a hard sheet that does not run well on the bag machines. In addition the low moisture means a decreased production from the machine, a high drying cost and a bag that is neither as strong nor as soft as otherwise might be obtained.

"Some of the factors to be considered in eliminating odor are:

1. Nature of odoriferous substances in kraft paper.
2. Effect of washing (degree of washing, hot and cold washes, residual soda, washing equipment, etc.)
3. Influence of pH on odor.
4. Removal of odorous substances by means of bleach liquor, sodium peroxide, hydrogen peroxide, etc.
5. Elimination of mercaptans by use of zinc salts or zinc hydrosulphite.
6. Change in drying equipment to produce more effective distillation of mercaptans on the paper machine."

The replies to this inquiry will be compiled into a Special Report and all those responding, will receive a copy of the Report when issued. Send replies to Secretary of TAPPI, 370 Lexington avenue, New York.

Deinking Plant Operating Factors

SPECIAL INQUIRY No. 154

A member writes: "We have made a detailed study of our own conditions and shall be glad to exchange information with mills deinking old printed magazine stock. We can give accurate data on the following:

Cooker Room:

Number of employees and wage rates
Total daily payroll
Tons per day paper cooked
Labor cost per hundredweight
Number of cookers dropped daily
Dry weight per cooker
Length of time per cooker
Time to load
Time to unload
Time steam on
Pounds of steam used per day
Pounds of steam used per hundredweight
Cost of steam per day
Cost of steam per hundredweight
Kw. hours used per day
Cost of Kw. hours per day
Cost of Kw. hours per hundredweight
Pounds of caustic used per day
Pounds of soda ash used per day
Pounds of cooking agent used
Cost of cooking agent per day
Cost of cooking agent per hundredweight
Overhead per day
Overhead per hundredweight
Total cost

Equipment: Number of cookers ( ) water heaters ( ) chests ( ) agitators ( ) water pumps ( ) stock pumps ( )

Cost to feed the cookers?

"We would also like to know the shrinkage in cooking the stock.

"What types of paper stock are treated?

"What deinking procedure is used?

"Details of equipment."

All contributing data to this questionnaire will receive a transcript in blank of a report that will be prepared. The identity of all replying will be kept *confidential*. The inquirer has contributed much valuable data and this will not be sent to anyone who will not supply the data requested. Send replies to Secretary of TAPPI, 370 Lexington avenue, New York.

Silicate of Soda in Box Board Cuttings

SPECIAL INQUIRY No. 155

A member writes: "I find that when corrugated box cuttings containing silicate of soda are used in top or under liner of sheet of container board, after the board is seasoned and when used in the box shop there is a distinct tendency for it to crack in creasing. When such cuttings are removed the difficulty is not evident.

"What experience have others had of a similar nature?"

All those replying to this inquiry will, of course, receive a transcript in blank, of the replies received. Send replies to Secretary of TAPPI, 370 Lexington avenue, New York.

TAPPI Notes

Raymond A. Gormley, formerly of the United Paperboard Company's technical staff has joined the sales organization of the Corn Products Refining Company in New York.

Albert B. Gregg who has until recently been engaged in the installation of Wagner furnaces for the J. O. Ross Engineering Corporation has taken a position in the sulphate pulp mill of the Champion Fibre Company of Canton, N. C.

Lyman Smith, formerly general superintendent of the Camas mill of the Crown Willamette Paper Company is now located at Crosby Terrace, Brattleboro, Vermont, and has made no definite plans for the future.

R. Filiat of Papeteries Navarre, a TAPPI corporate member is now visiting in New York.

R. H. Laftman of Bogalusa sailed on Saturday for Sweden where he expects to remain for a few months. He may be reached at Amal, Sweden.

A. E. Sjoman, chemist for the Tomahawk Kraft Paper Company died suddenly last week from a heart attack.

Dr. K. A. Taylor of the Oxford Paper Company has been appointed chairman of the Technical Association committee on the preparation of non-fibrous materials.

Gunnar Barrling, a Swedish engineer representing the Patent A/B Grondal-Ramen owners of several patents relating to the sulphite pulp industry and sulphur production sailed for Sweden last week.

Westfield River Paper Co. Joins TAPPI

The most recent company to become a corporate member of the Technical Association of the Pulp and Paper Industry is the Westfield River Paper Company of Russell, Mass.

This company manufactures 15,000 pounds daily of glassine which is marketed under the well known name of Paperglass.

The mill equipment consists of four 1,200 pound beaters, two refiners and one 60 inch fourdrinier paper machines.

Alfred Leeds is president, Paul F. Moore, vice president, J. J. Costello, treasurer and L. D. Frisbie, superintendent. The company will be represented in the Technical Association activities by Paul F. Moore.

Columbia River Paper Mills Report

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., March 14, 1931.—Net income of the Columbia River Paper mills, Vancouver, Wash, for 1930, before deducting interest on funded debt and before depreciation and federal income taxes, amounted to $374,748, which is equal to seven times total interest charges on funded debt. Total current assets were $794,239 and total current liabilities were $304,220.

Heat Conservation In Paper Mills*

By D. K. Dean [1]

The fuel bill is one of the important costs in a pulp and paper mill, and it is logical that attention be concentrated on that phase of production. It is also true that great opportunity for improvement exists in the production and conservation of heat units for power and process operations of the paper industry. Some of the more recent developments will be touched upon in this paper, either as entirely new or as sufficiently recent to have escaped the attenion of many engineers in the industry.

Pulp Suspensions

Among the problems facing certain mills is that of conserving the large quantity of heat which is contained in heavy pulp suspensions. Where a fluid is comparatively clear, a recovery of heat may be secured through a simple, tubular type of heat exchanger, but where the fluid contains an amount of fibrous material, as in the case of plants in which book stock is de-inked, the use of tubular heat exchangers is impossible since the tubes plug up rapidly and the equipment is rendered incapable of functioning.

A method of overcoming this difficulty has been developed and is now in operation. Two installations are performing very well after being in use for a year. The method used for recovering heat is to pass the hot pulp suspension into a chamber which is maintained under vacuum. The incoming pulp suspension is spread out as it flows into the chamber and is then permitted to fall through the chamber to a pulp pump.

Because of the vacuum maintained by a heater-condenser, and a steam jet vacuum pump, some of the water in the hot suspension is flashed into steam. This steam is drawn over to the heater-condenser in which the vacuum is created, and comes into contact with sprays of fresh water. The vapor is thus condensed and the fresh water is heated. This clean, hot water falls to the bottom of the condensing chamber, whence it is pumped to the next stage in the process. The arrangement is simple, and the only moving parts are those of the clear water and pulp pumps. Process water is used to condense the flashed vapors and, in this way, not only the heat but some of the water in the pulp suspension is recovered for subsequent use. This apparatus is diagrammatically illustrated in Fig. 1.

A modification of the principle is one in which two stages of flash evaporation are employed giving the effect of a counter current design. This is shown in Fig. 2. With this compound arrangement the hot pulp suspension is led to the first stage flash chamber, as before, and some of the water is vaporized, is carried over to a direct contact heater-condenser chamber, and is condensed by the fresh feed. The condensate and heated water are removed by a hot water pump, and delivered to the next step in the process. The partially thickened pulp flows to a second stage flash chamber, passing to it through a loop seal to provide for a difference in vacuum in the two chambers.

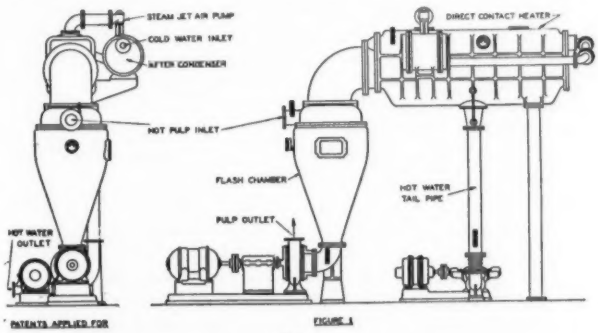

FIG. 1

A single stage heat exchange system for paper mills.

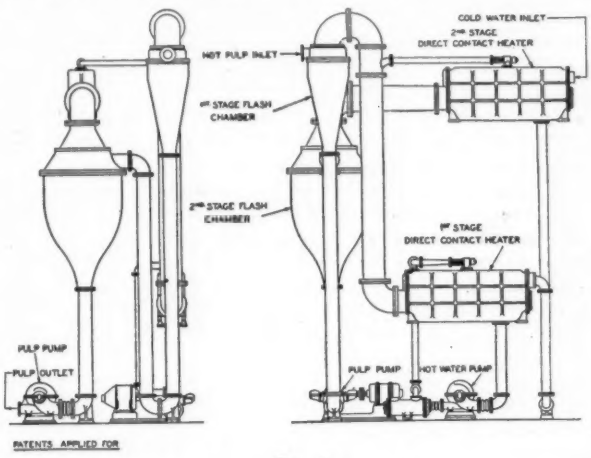

FIG. 2

The arrangement of the two stage heat exchange system for paper mills. This system is in effect two single stage systems operating in series, so that there is produced a counter-current flow of raw water and pulp.

The balance of the evaporation of water from the pulp is effected in the second stage flash chamber, and the pulp passes to a pulp pump.

The cold process water enters the second stage direct contact heater-condenser, is partially heated in it, and flows by gravity into the first stare direct contact heater-condenser, where it acts as condensing water.

In all cooking processes, in which pulp is prepared in digesters, much heat is lost each time a digester is blown. A study of this process frequently indicates that large savings can be made in the recovery of a portion of this heat. At the end of the cooking time the valve is opened at the bottom of the digester and the pulpy mass is blown out into the blow pits by reason of the pressure of the steam within the shell. The sudden release of pressure results in the release of steam from the liquor. The pulp customarily passes through a suitable separator and the steam which is freed by the sudden drop in pressure ordinarily escapes.

Wherever there is use for hot water in some other stage of the process, such as in washing down of the blow pits and washing the pulp the steam that escapes can be recovered to advantage by the installation of a direct contact heater and a suitable water circulating pump.

Fig. 3 shows a typical installation in which the blow pipe from the digester delivers directly into the blow pit. In passing from the digester through the blow pipe and into the blow pit, a large volume of steam is set free and separates from the rest of the pulp in the blow pit and passes through an exhaust pipe into a separator which is designed to remove small portions of pulp which might be entrained by the large volume of steam. These particles of pulp are thrown out in this separator, and the main body of steam passes on to the direct contact heater.

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* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Heat and Power Committee.

[1] Development engineer, Foster Wheeler Corporation, New York, N. Y.

The direct contact heater is of special design. It should be of a counter-current type to secure the maximum heat recovery. The passages inside of the heater should be of sufficient area as to permit the full volume of the blow off steam to pass through the heater without building up an injurious pressure in the blow pit, exhaust lines or in the heater itself, in case, for any reason, the water supply should be shut off from the heater. It is, therefore, good practice to provide a full size exhaust opening on the top of the heater discharging to the atmosphere.

The selection of the heater and the circulating water system usually requires a considerable amount of study. In an ordinary size digester the blow off takes place only at intermittent periods, and for short intervals. The blow off period is usually from ten to twenty minutes. Inasmuch as the use for water is probably more or less continuous, it is usual to provide a hot water storage tank for regulating the flow for the rest of the process. The size of this storage tank and the heater itself can be determined only after knowing the amount of steam to be expected at each blow, the water requirements for the rest of the plant, the duration of blow and the schedule of blow offs for the various digesters in the plant.

An example will illustrate the application of a direct contact heat recovery system for such work. Consider a digester with a 12 foot diameter and cylindrical portion 28 feet long and a total volume including the conical discharge portion and the head of 3610 cubic feet. A nominal charge for such a digester would consist of 1275 cubic feet of wood chips and 1675 cubic feet of liquor or a total volume of 2950 cubic feet. This would leave 660 cubic feet of steam space above the pulp level. If this pulp were cooked under a pressure of 125 pounds per square inch gage, the temperature of the pulp liquor would be in the neighborhood of 350 to 360 deg. F. Upon blowing, the pressure would suddenly be released from the digester pressure to atmospheric, at which pressure the boiling point of the liquor would be between 212 and 220 deg. F. and the heat content of the pulp suspension would be reduced by an amount corresponding to the drop in temperature from within the digester to that on the outside of the blow valve. The difference in the heat content of the pulp liquor before and after blowing, plus the heat content of the steam released from the digester shell itself would amount to approximately 18,960,000 B.t.u. per blow. This heat would appear in steam, part of it released directly from the digester and part of it generated from the liquor in the pulp at atmospheric pressure.

In this particular case, the amount of steam released in each blow would be on the order of 19,500 pounds, from and at the boiling point at atmospheric pressure.

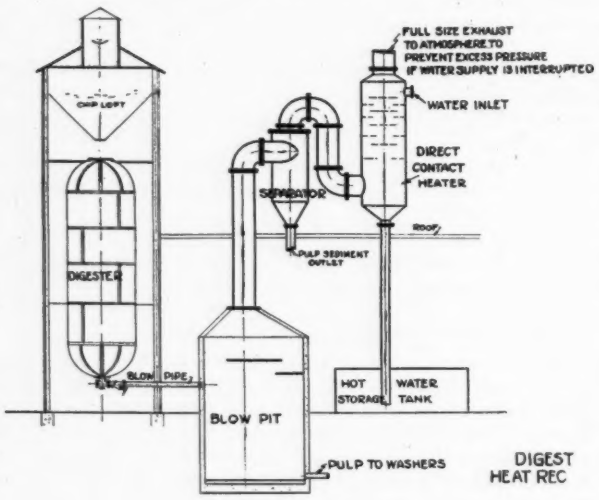

FIG. 3

Arrangement of a heat recovery system to be operated in conjunction with digesters.

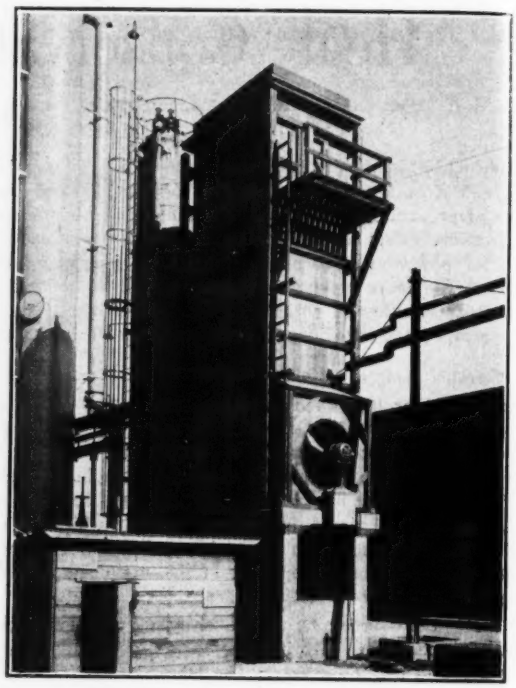

FIG. 4

A redwood cooling tower.

If a blow period were fifteen minutes, there would have to be an amount of water supplied to the direct contact heater sufficient to condense this steam within that period.

In blowing a digester, the rate of steam delivery is not constant, there being a much greater amount of steam generated during the first portion of the blow than during the latter portion. By dividing the period of blow into three stages a typical operation would call for the generation of steam at twice the average rate during the first third of the period and the generation of steam at about two-thirds the average rate during the second period and a generation of steam at about one-third the average rate during the third period.

Necessarily the water supply must be proportioned to condense the steam at the maximum rate of the first period. Various methods of control have been suggested. It might be possible, in the first place, to regulate the blow off rate so as to be fairly constant throughout the whole period, or it would be possible to vary the quantity of water entering the direct contact heater so as to be just suitable for condensing the steam at any moment while maintaining the temperature desired. Usually, however, it is not necessary to introduce the complications for controlling either the rate of steam generation or the quantity of water supplied as the water requirements during a twenty-four hour period are generally in excess of the amount which could be heated during the times of intermittent blowing.

Taking the above example as an illustration, and assuming that cold water is available at a temperature of 70 deg. F., and further assuming that the blow period should be fifteen minutes and that the rates of blow would vary as indicated, it would be possible for instance, to design a direct contact heater capable of condensing steam at the rate corresponding to the flow during the first portion of the blow period while heating water to a temperature of 200 deg. F. In this case, the water requirements would be 2,330 gallons per minute. By circulating this water at a constant rate, the final temperature

of the water during the second third of the period would be 113½ deg. F., and during the third portion of the period would be 91.8 deg. F. The ultimate mixture of the 34,950 gallons per fifteen minutes passed through a direct contact heater and into the storage tank would be at an average temperature of about 135 deg. F. This operation would result in the recovery of practically all the heat in the steam flashed at blowing. Assuming that this heat would otherwise have to be supplied by steam under a pressure of 125 pounds per square inch gage, the heat recovery would be equivalent to the saving of approximately 16,400 pounds of live steam. If we assume that this particular digester should be blown three times per day, the total steam saving would be 49,200 pounds, which at a price of thirty-five cents per one thousand pounds would correspond to a saving for each digester of $17.20 per day, or in the neighborhood of $5,000.00 per year. The total saving to the plant under these conditions could be determined by multiplying this amount by the equivalent number of digesters of the size assumed in continuous service. From the above total saving, there should, of course, be deducted a slight amount to cover cost of operation of the circulating pumps. It is quite apparent that with a plant having several digesters, say six for instance, the total savings would be very appreciable, in this case, about $30,000.00 per year. Usually the first cost of the installation of the recovery system would not amount to more than one third of this sum.

Machine Rooms

In the machine rooms of paper mills, the heat losses represented by the evaporation of wataer from the paper and by convection from drier rolls are appreciable.

It is necessary to furnish a continuous supply of air in machine rooms to bring about the evaporation of the water at a reasonably low temperature. The air from outdoors is heated in two ways after entering the room; by the steam given off by the drying paper and by contact with the exposed portions of the drier cylinder. The air at the top of the room may be at temperatures of 150 or 160 deg. F. When this hot air discharges from the room it usually is not saturated although it contains

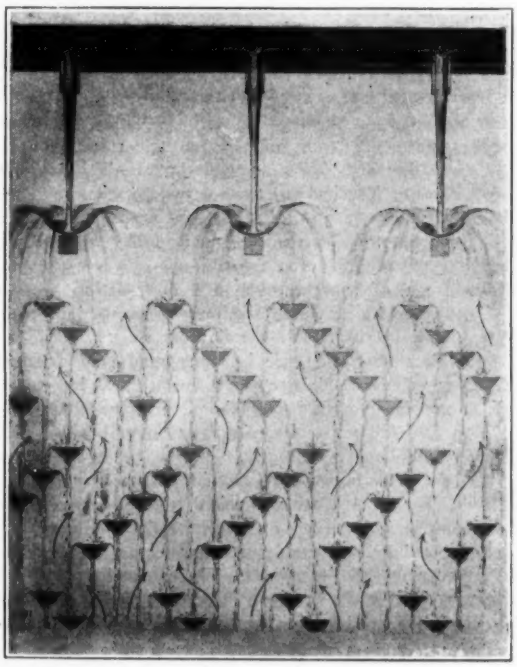

FIG. 5
Water distribution in a cooling tower.

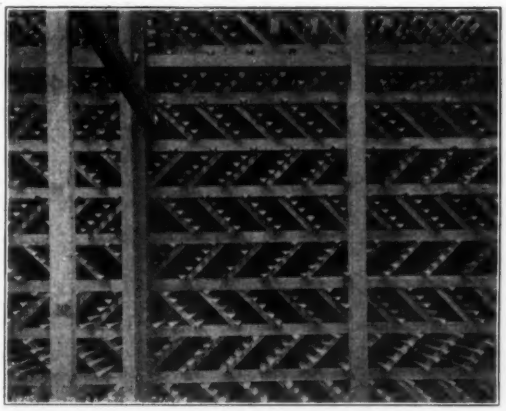

FIG. 6
Filling of a cooling tower.

a large amount of moisture. This is due to the superheating effect of the hot, dry surfaces of the cylinder exposed to the air in the room.

The fact that this air is at an exit temperature as high as 150 deg. F. makes it possible to recover profitably some of the heat, ordinarily carried away, in plants in which hot water may be used to advantage in some step of the process. A large number of paper mills have use for such hot water.

An interesting recovery system has been recently installed for coping with this situation, and its low initial cost with high return may well bring about its general adoption.

It was ascertained in a leading paper mill that there was exhausted continually from the machine room between 50,000 to 70,000 cubic feet of air per minute, containing a high per centage of moisture, at a temperature of about 150 deg. F. This mill had use for large quantities of hot water. The result of a study of the situation led to the installation of a heating tower which was constructed in accordance with the general design of forced draft cooling towers, as shown in Fig. 4. This heating tower is constructed of California redwood throughout. This wood is very highly resistive to deterioration under the severe conditions imposed by the operation contemplated with this tower. Such operation requires that the inside of the tower shall be wet most of the time while the outside of the tower, being exposed to the outdoor conditions, may be dry. In order that the tower shall be capable of withstanding such action over an extended period, the framework for the support of the tower is entirely exterior to the operating portion and is accordingly subjected only to the effects of atmospheric conditions and is free from direct contact with the water being heated.

The tower is provided with a gravity distribution system consisting of a series of troughs provided with nozzles through which the water to be heated falls. This water impinges upon brass splash plates, is broken into fine drops and is spread over the filling, or heating surface, as shown in Fig. 5. The heating surface consists of an extended filling made up of triangular strips of redwood placed in staggered relation to one another (Fig. 6), completely filling the shell between the distribution system and the upper portion of the inlet duct, or fan opening. While the figures shown are representative, in the particular installation referred to it was not necessary to provide fans at the base of the tower as these fans were already built in as a part of the ventilating system at the mill.

The installation was guaranteed to be capable of heating 300 gallons of water per minute from 65 to 110 deg. F., when supplied with 52,650 cubic feet of air per minute measured at a barometric pressure of 30.29 inches, and having a dry bulb temperature of 150 deg. F. and a wet bulb temperature of 120 deg. F.

The tower was connected to the ventilating system of the mill. As the tower was 36 feet high it was anticipated that the chimney effect, resulting from the difference in density of the air within and without, would overcome such resistances to the flow of air as might be imposed by the filling of the tower, obviating any increase in the power requirements of the ventilating system.

After the tower had been put into regular operation an exhaustive test was run to determine the results secured. In this test there was delivered from the ventilating system 61,800 cubic feet of air per minute at a dry bulb temperature of 151 deg. F. and a wet bulb temperature of 118 deg. F. and with a barometric pressure of 29.25 inches of mercury. Water was delivered over the tower at the rate of 348 gallons per minute and was heated continuously from an average inlet temperature of 66 deg. F. to an average outlet temperature of 110 deg. F. These results represent a close check on the performance guaranteed.

Measurements were also taken of the draft effect in the tower and it was ascertained that, when operating as intended, the tower produced a slight draft at its base tending to assist the ventilating fans in removing air from the machine room.

In heating the 348 gallons of water per minute from 66 to 110 deg. F. there is represented a heat recovery of 7,656,000 B.t.u. per hour. Assuming a cost of 30 cents per million B.t.u. the hourly recovery amounted to about $2.30. On the basis of an annual operation of 7000 hours the actual saving resulting from this heat recovery would be about $16,000.00. The total first cost of the installation only amounted to about one-third of this sum.

Suction Couch and Press Rolls*

By B. T. McBain [1]

There are different makes of suction rolls for different uses but I am particularly pointing out the advantages of suction rolls for paper and pulp drying machines for couch and presses.

People in the paper industry, generally speaking in my opinion, are not as progressive as they should be. Up to a few years ago there was nothing new on a paper making machine. Each new machine was practically a duplicate of the last one built except a little wider, perhaps, roll diameters larger on account of the additional width and a greater number of driers where faster speeds were to be tried. Nothing in fact but an enlargement of the smaller old machine.

In 1910, I believe, three Pacific Coast pioneers of the industry came East to try and get someone to build a 234 inch machine to run 1,000 feet per minute. There was no one able or willing to build such a machine except one Northern New York builder. No companies could make felts and wires for it. That machine was never built but the plans laid out for it were duplicated about ten years later.

Twenty years ago or thereabouts, the first suction rolls were installed at the mill of the Everett Pulp and Paper Company, Seattle, Wash. Later I secured some rolls tried somewhere else and said to have been found wanting, not because of the rolls, or any defect in their make, but because the mill first installing them could not learn new tricks. The first successful installation of a suction couch anywhere, however, was at the mills of the Hammersley Manufacturing Company in New Jersey.

William H. Millspaugh deserves credit for the dogged determination with which he introduced his invention.

Today a new straight Fourdrinier paper machine without one or more suction rolls is a novelty. Even some Yankee machines are being equipped with the new Beloit type of suction roll, the shells of which are made at the Paper and Textile Machinery Company plant at Sandusky, Ohio. There are still paper-makers, however, who think as of old and say "it can't be done." This type of operator is fast being replaced by the younger generation and it will not be long now before every mill will be so equipped.

My own first experience with a suction couch was on greaseproof in 1915. Although it was a success I found that with a couch alone, many of the old couch breaks were transferred to the first press. It was then necessary to try again, so I secured a suction press roll and my troubles were over for the stock after the first press was sufficiently firm to carry any defects or lumps through the balance of the journey to the reel.

A history of the suction roll is not necessary for this paper, as I believe this was reported by the press of the industry when the subject was in the courts. Suffice it to say, however, that the Beloit Iron Works have developed the most outstanding improvements and the Paper and Textile Machinery Company of Sandusky, Ohio, according t word from them, is now advocating and offering the Beloit type of roll with small bearings and other up-to-date features rather than the old geared Millspaugh roll. However, had Mr. Millspaugh not been persistent and consistent the industry today would probably still be wallowing along in the old ruts.

Use on Special Grades

Of course, it is generally known that for the different weights of paper to be made the amount of water in the stock is different, a light weight having considerably more water per unit than a heavy weight of like grade. For instance a 10 pound 100 per cent sulphite toilet tissue requires considerably more water for conveying and formation purposes than a 30 pound news print sheet. This water must be removed to about 16 per cent consistency between the slice and the couch. How? For the very light grades it is in my opinion better to carry the stock from the wire through the first press by a felt over a top couch. In that case the water must be removed by table or tube rolls and flat suction boxes. There are many ways of using these. One mill known to many has a set of boxes immediately following the slice in the place of three or four of the table rolls; then at the usual point another set of five or seven boxes. This mill makes a very fine sheet of bleached toilet tissue, 100 per cent sulphite and creped and runs this grade at about 900 feet per minute, minimum.

News print cannot be economically made today without suction rolls and it is my opinion that we will not only see the present day common use of suction couch and one suction press continued, but two and even three suction presses used in place of the present straight rubber and metal press rolls.

Suction table rolls are in use in Europe on pulp drying machines. They will be used here when the newness has worn off and the more conservative papermakers recognize their advantages. I am told there are some in the new mill of the Puget Sound Pulp and Timber Company.

Six or eight years ago in Wisconsin only a few mills used suction rolls. Mr. Millspaugh was asked to come out to a Superintendents Association meeting at Stevens Point. A questionnaire was prepared and 100 questions put in a question box supposedly placed by as many superintendents. These questions covered all the criticisms that were current against suction rolls. When that meeting was over, nearly all the men present who had one or more rolls stored in the warehouse brought them out and put them into use. The company I was with soon learned the value of the equipment and placed suction rolls on its machines, pro-

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Paper Manufacture Committee.
[1] Member TAPPI, consulting engineer, Portland, Oregon.

ducing thereby greater additional profit from greater product and better quality.

There are still mills making fine papers where the superintendent cannot see the need of suction rolls. They contend that they cannot continue to make their present grades with his new kind of equipment. I am not a fine paper man and they may be right but I have seen the finest ledgers, bonds, books, onion skins and bristols as well as most all the coarser grades made with suction rolls, and to the great advantage of the mill in more ways than one. Of course, the water must be handled right; the correct vacuum must be used for the weight run, and the first press felt must be special for suction press use to get the perfect results possible. The rolls must also be taken care of both inside and out.

For grease proof and glassine I do not see how anyone can compete today without using suction roll machines.

The Vacuum Forming Paper Machine

Mr. Millspaugh invented a new type of machine and built one before leaving for his world cruise. This machine is entirely new from flow box to driers, the forming wire and presses being placed "almost upside down" as compared with the orthodox papermaking equipment. I remember my old chief saying fifteen years ago, "Bert, you will see paper made on a Fourdrinier standing on end long before you are as old as I am." Mr. Millspaugh's wire just makes this prophesy come true. I have seen this machine in operation. Of course, it is not yet perfect, but I believe it has great possibilities in many lines of manufacture. It has a large diameter suction breast roll resting in the flow box, the sheet being formed on the suction box. Many of these wire parts may be handled together thus making a duplex, triplex or possibly greater ply sheet, the paper being removed each time with suction rolls when transferred from one wire to another or from wire to press felt and before entering the drier a stack of three or four suction press rolls is used to remove a maximum water content. One such machine, I am told is in Virginia and another in New Jersey, one on heavy papers and the other on a heavy felt. It will be used elsewhere when perfected by the present pioneers who deserve credit for their foresight.

Suction rolls will not replace all suction boxes, but suction rolls have done more for the industry in the past decade than any other one thing.

Application of Suction Rolls

The success of suction couch and suction press rolls has been marked from the beginning. They have been almost universally adopted by the paper industry. Most of the important book mills of the United States have all of their mills equipped with suction couch rolls. They have found their paper more alike on both sides, that it had a better retention of filler, that the sheet was more nearly closed, took better laid and water marks, and as it was not strained at the couch rolls, it took offset, rotogravure, multi-color and map printing in a better manner.

Fine writings, bonds, ledgers, weddings, etc. have been found more uniform in appearance, denser, and the same advantages in water marking observed. With improved quality has come increased production in these grades.

A larger percentage of the wrapping paper and kraft mills are using suction couch and suction press rolls. The quality of roofing papers has been generally improved by elimination of crush, the sheet has been left in better condition for saturating, carrying a higher percentage of tar. Machines making straw or corrugating papers are generally equipped with suction press rolls. The same may be said of mills making glassine, waxing, tissue and light weight specialties.

The paper industry has given credit to the part played by suction couch and suction press rolls in the development of the modern high speed news machines. More recently the value of the second suction press is evidenced by its adoption in several of the foremost news print mills in Canada and some news and kraft in the United States. As a result of some second suction press roll installations in prominent southern mills, making various grades and weights of kraft papers at high speeds, it has been demonstrated that the sheet goes to the driers with a lower moisture content. This results in greater production and lower steam consumption. The suction second press is fast receiving the recognition it deserves.

Engineering Division Annual Report

The reorganization of the committees the past year, by your executive officers, has resulted in a more formulative and workable plan.

In the consolidation, your chairman appreciates the cooperation of Dr. J. D. Rue, J. D. Miller, and Frederick Wierck, as chairmen of Heat and Power, Materials of Construction, and Equipment Committees, respectively, in the formation of the committees and sub-committees.

A tentative outline or scope of work to be followed, that would broadly cover the activities, was planned. This program has been published and is offered to the members for use. In this way more interest and cooperation may be obtained. In following this procedure, your committees have obtained some very interesting papers for the annual meeting.

Further, the committees will present reports covering the work accomplished for the year.

Due to the time and thought given to more constructive committee work, it is thought that in continuing along the lines suggested by the executive officers, the work will be of more interest.

The prime object of your committees is not necessarily to review altogether the past problems, but rather to study and present the problems to be worked out and interest our members in new developments, as applied to the paper industry.

For the most part, the work attempted by your committees the last year has been to investigate the advancements made in power plants, advantages gained in new equipment, and the uses of new alloy metals, ceramics, and other building materials.

In view of the new committee arrangements, it is our recommendation that, especially in the more technical studies and papers to be presented, an opportunity is now available, in that more time must be allowed those who are offering their efforts in this direction to properly arrange their papers and meetings for the best results.

As the prime object of the Technical Association is in one general direction, (represented by the officials and committees) by proper arrangement of general outlines of procedure, known to all committees, it would provide a more workable program, one that can easily be taken up by new chairmen readily, and the proper records kept.

It is therefore recommended by your chairmen of the above committees that we continue to adopt this method, which will provide possibilities of carrying through unfinished work, to the following year.

JOHN F. RHOADES, General Chairman

INSULATION OF ROTARY BLEACHING BOILER

Apparatus—14-ft. rotary (spherical) bleaching boiler.

Boiler surface subject to insulation, sq. ft.	585
Steam temperature in boiler (assumed average), deg. F.	287
Room temperature (assumed), deg. F.	70
Temperature differential between boiler and room, deg. F.	217
Heat loss, uninsulated boiler, Btu./sq. ft./ hr.	597
Heat loss, insulated boiler, Btu./sq. ft./hr., Block method	57
Cement method	57
Heat saved by insulation, Btu./sq. ft./hr.	540
Heat saving per cook of 7 hrs., Btu./sq. ft./hr.	3780
Steam saving per cook, lbs./sq. ft.	4.11
Steam saving per cook per boiler (total), lbs.	2404
Steam cost ($0.50/M. lbs.) of saving per cook per boiler	$1.20
Annual saving due to insulation (based on 6 cooks/wk.)	$374.40
Approximate insulation cost per boiler (total)	$450.00
Gross annual saving per boiler	374.40
Annual fixed charges (25 per cent based on 5 yr. amort.)	113.00
Net yearly saving per boiler	261.40
Net yearly return on investment, per cent	58

Johns-Manville.

Heat Transfer Through Cast Iron Drier Shells

By F. C. Stamm [1]

There is no doubt but that the limiting factor in production on most of the older machines today is the capacity of the drier section. Beaters, jordans, pumps, screens and even the wet end can, in most cases, be speeded up—sometimes at a sacrifice in quality—but when you come to the driers, you will meet a condition which cannot be handled quite so easily. On any one grade of paper there seems to be a definite limit in speed, and if that speed is exceeded damp paper will be wound on the reel.

How many managers, when pushing production to the limit have asked, "Are my driers drying all they should at the steam pressure which we are carrying." Not even the specialist has been able to give him a definite answer. This lack of accurate information on drying is due to the number of variables that enter into the problem, each one affecting the evaporation of water from the sheet to a marked degree. Some of the most important of these variable factors are:

1. Steam pressure in the drier.
2. Heat transfer through the drier shell.
3. Humidity of the air surrounding the driers.
4. Tension of the sheet against the drier face.
5. Length of time the sheet is in contact with each drier.
6. Moisture to and from the driers.
7. Width of the sheet.
8. Caliper of the sheet.
9. Formation of the sheet.
10. Furnish—clay will slow up drying.
11. Degree of hydration of the stock.

Is it any wonder that we are unable to make an accurate analysis of a problem when there are so many unknown variables to contend with, and each of these variables present a good sized problem? The only way we can hope to make any headway on the subject is to study each individual factor separately and from these data and conclusions gain understanding of the problems as a whole.

With this program in mind, the committee on drying has selected the second item on the list for study this year and has tried to gather all the information possible on the factors that directly affect the transfer of heat through cast iron drier shells. These factors can be tabulated as follows:

1. Oil and scale on the inside of driers.
2. Rust and size accumulation on the outside of driers.
3. Water film on the inside.
4. Air film on the outside.
5. Circulation within the drier.
6. Accumulation of condensate within the drier.
7. Accumulation of air within the drier.

Oil and Scale on the Inside of Driers

The problem of oil accumulating on the inside of a drier shell has been very much over-stressed. From all the information that can be gathered, we have not been able to find anyone who has actually found an oil deposit on the inside of a drier. We do not say that this is impossible. There may be installations on old driers which have been operating for the past thirty years, where the pressure has been low, the drainage poor, the driers operating almost continually half-filled with water, where an excessive amount of cheap, lubricating oil has been used, and under these conditions, it is very possible that you will find a coating of oil and rust on the inside of the driers, but this condition shows very poor housekeeping and should not be allowed to exist.

Any drier that is given even the slightest amount of attention will not have an accumulation of oil and rust on the inside.

Rust and Size Accumulation on the Outside of Driers

There is a tendency for the wet end driers to become coated with a deposit of size, fiber and rust which bakes on to the surface due to the excessive heat.

Some claim that this coating is beneficial in order to prevent sticking of a light sheet to the driers; others claim that it tends to eliminate cockling. Using a coating of this sort to prevent these troubles is purely a makeshift, since a careful control of the temperature on these driers will, in most cases, completely do away with sticking and cockling and readily solve these problems.

All driers on the wet end should be equipped with good doctor blades so that the surface will be kept clean and polished and ready to give up its maximum amount of heat when it is needed.

Water Film on the Inside of Driers

This factor is more or less beyond our control but many attempts have been made to speed up the heat transfer by eliminating this film. There are a number of patented devices which have been developed primarily for this purpose. First, a scraper or doctor device has been brought out to wipe the film from the inside of the drier mechanically; second, a set of steam jets have been located inside of the drier so that the incoming steam will be discharged directly against the inside of the drier. The velocity of the impinging steam tends to break through and remove this film.

We cannot help but think that there has been too much emphasis placed on this item, because theoretically, the drop through this water film is very small. According to Marks, the coefficient of heat transfer through a film of condensing steam is approximately 2000 B.t.u.'s per square foot per degree difference per hour. When you stop to consider that the average drier will only transmit from 2000 to 2600 B.t.u.'s per square foot per hour, you will see that there need be a drop of little more than 1 degree to accomplish this work. This is so small that it need not be considered in practical, everyday drying.

Air Film on the Outside of Driers

The air film between the face of the drier and the sheet is no doubt detrimental and one which can never be entirely eliminated. There are, however, many things that can be done to improve the heat transfer and cut down the resistance of this film.

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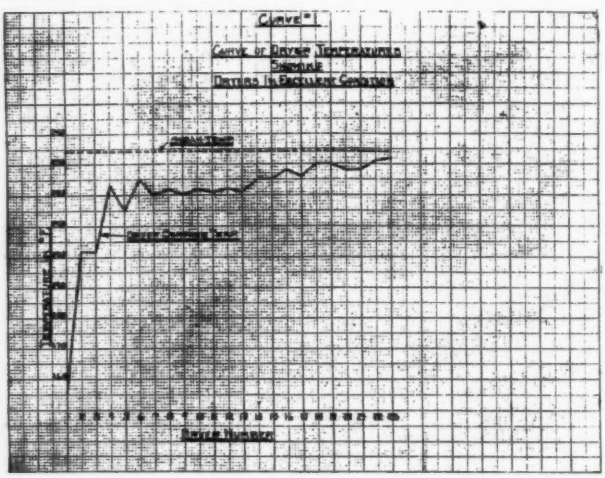
* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Heat and Power Committee.

[1] Works engineer, The Upson Company, Lockport, N. Y., TAPPI Corporate member.



Curve 1

The closer the sheet hugs the drier, the better will be the contact and the better will be the heat transfer. A smooth, highly-polished drier will give a much better contact and, therefore, a much better heat transfer than a rough, uneven surface. A light, even sheet will hug the drier closer and will, therefore, dry better than a course, lumpy sheet. More tension on the drier felts will press the sheet against the drier face, which in turn will result in a better heat transfer. Anything that is done to hold the sheet closer to the drier and help displace the air film between the drier and the sheet is sure to be reflected by improved drying conditions.

Circulation Within the Driers

There has been much emphasis placed on the matter of circulation through a drier in order to obtain the maximum rate of heat transfer. To test the effect of circulation on the rate of heat transfer, a drier near the wet end was disconnected from the return line and piped up so that it could be blown straight through to atmosphere. With twenty-five pounds steam pressure in the drier and no circulation, the temperature of the face of the drier was 264 deg. F. A valve on the return line was then opened a turn at a time with a ten minute interval between changes.

In this way, circulation within the drier was gradually speeded up until at the end of 1½ hours, the return line was wide open and blowing straight to atmosphere. The difference in pressure between the supply line and the return line was, therefore, twenty-five pounds. The drier was allowed to blow straight through for a period of two hours and at the end of this period, the valve was closed and a trap cut into the return. This trap dumped regularly and took care of all the water that condensed inside of the drier but did not allow any circulation whatever.

Conditions were left like this for a period of four hours, during which time, no condensate collected inside the drier and there was positively no circulation within the drier. At no time during this entire test was there any change in temperature noted and at the end of the test, the surface temperature of the drier still remained a 264 deg. F.

Tests similer to this one were repeated a number of times but at no time could we show any increase in heat transfer or any rise in surface temperature brought about by a change in circulation through the drier. Our conclusion was, therefore, that circulation within the drier had no effect whatever upon the heat transfer through the drier shell.

Accumulation of Water Inside of the Drier

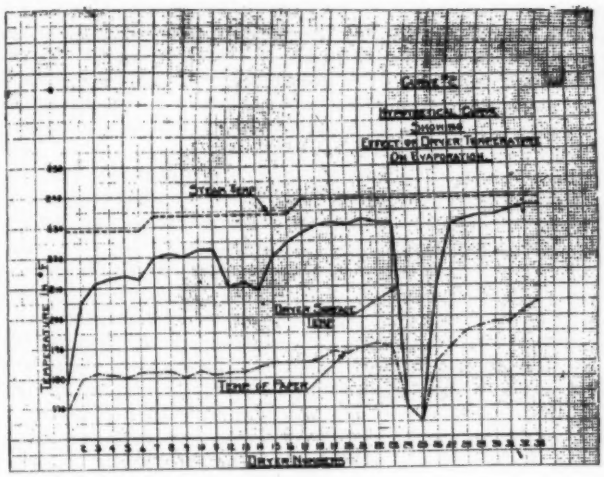
In order to determine the actual affect of water on the inside of driers, we allowed a drier to gradually fill with condensate and observed the surface temperature during this period.

A drier well towards the wet end was chosen and carefully checked for adjustment of the syphon pipe. This drier was disconnected from the return header and allowed to blow free to atmosphere for about fifteen minutes, to be sure that no accumulation of water was present. The return line was then closed and the temperature of the surface taken with a surface pyrometer and found to be 262 deg. F.

The return line was left closed for a period of eight hours and at the end of this time, there was approximately fourteen inches of water in the drier which was determined from a petcock placed in the head. During the test period, readings were taken every half hour but no change in temperature was noted and the drier was still 262 deg. F. at the end of the test. This test was repeated two or three times but with always the same results.

We also observed the result of water in a top and bottom drier. In the bottom drier, the water was naturally on the bottom and our temperatures were taken on the top. In the top drier, the water was on the bottom and our temperatures were also taken on the bottom. There was absolutely no difference in the results and we, therefore, concluded that water in a drier does not materially affect the heat transfer.

It must be understood that the water in these driers did not rotate with the drier as is possible under certain conditions with high speed machines. If the water should rotate or "carry over" with the drier, such an accumulation would offer a large resistance to the flow of heat.



CURVE 2

Please do not misconstrue that we are advocating leaving water in driers, since it makes the drier sluggish to quick changes in temperature, and also increases the power required in the drier section. We are considering the accumulation of condensate purely from a standpoint of heat transfer and as such conclude that it has no ill effects whatever.

Accumulation of Air Inside the Driers

The effect of air inside of driers has been given very much attention and rightfully so, because our experiments seem to indicate that air is the one and only factor which materially affects the transfer of heat. Our time and equipment limited us in gaining accurate information on the effect of varying amounts of air. However, we were fully satisfied that the heat transfer through a drier varied in proportion to the percentage of air inside the drier.

We tried many experiments allowing varying amounts of air to enter the drier and found that we could vary the surface temperature anywhere from 215 to 262 deg. F. depending on the amount of air we let into the drier.

It was evident that even a small amount of air would reduce the heat transfer as much as 5 to 10 per cent. We also found that a drier which is filled with air and operating at a temperature of, say, 215 deg. F. will remain there indefinitely as long as the return line remains closed so that the air cannot escape, but as soon as this drier is cut into service with a one pound differential between the steam line and the return, the air was removed very quickly and the drier brought up to temperature in less than fifteen minutes. We, therefore, cannot stress too strongly, the point that air, even in very small quantities, inside of a drier, will materially affect the transfer of heat.

General Observations of Dryer Surface Temperatures

Summing up the various factors that affect the transfer of heat, it seems that there is only one major item that appears to be troublesome and that is the accumulation of air within the drier. Yet our tests have shown definitely that, with a little circulation, air can be easily and completely removed from the drier. Why then have we all been baffled by problems where two machines of practically the same size, with the same make of drainage control and using stock from the same beater chest will show such widely different results in drying?

From our observations, we would say that the answer in the majority of cases could be found in the condition of the syphon pipes. Most people conclude when they install a patented drainage

system that from then on their troubles will be over. This is far from being the truth. The syphon pipes are really the heart of your whole system and unless the syphon pipes are properly adjusted and are open and functioning right you are sure to run into bad drying conditions. It is possible for a set of syphon pipes to be in excellent condition today and six months from now to be considerably out of order.

Oil and rust may accumulate inside of the pipes and gradually plug them up. If the adjustment of the pipe is not correct, it will rub on the bottom and not present a large enough opening to allow the water and air to get out. The syphon may become loose and rub on the journal, thus wearing a hole which breaks the syphoning effect of the system. With a good differential through the machine and the syphon pipes all in good order so there is no chance for air to accumulate, there is nothing else that can possibly speed up the heat transfer through a drier aside from the various minor factors that we have just mentioned.

There is really only one sure method whereby the exact condition of a drier can be determined and that is by taking the surface temperatures with a pyrometer. Checking the drainage or differential on a machine does not tell the condition of each individual drier. The usual method of holding a thermometer in the pinch between the drier and the sheet is misleading since it actually shows the evaporating temperature of the water in the sheet. This temperature of evaporation will hold fairly constant between 180 and 190 deg. F., while the actual drier temperature might vary from 200 to 260 deg. F. A study of the actual drier surface temperature will show quickly and accurately whether or not you are getting all you can expect out of your driers.

Theory of Heat Transfer

To understand just how much we can expect from a drier let us consider the transfer of heat from a theoretical standpoint and then see how close we can expect to come to this figure in actual practice.

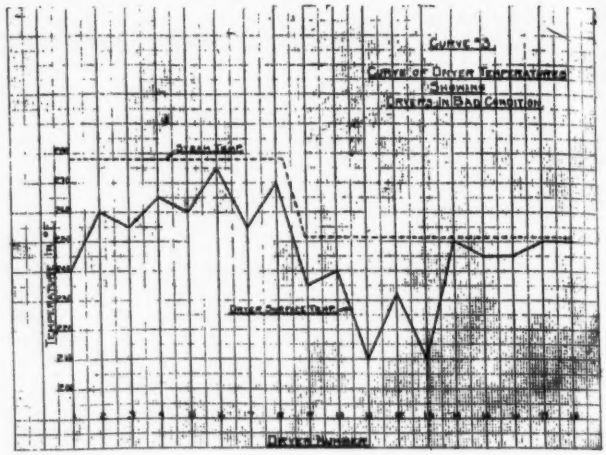
The average drier, drying one pound of paper per square foot per hour will transmit from 2000 to 2600 B.t.u.'s per square foot per hour. As has been previously brought out, the drop through the water film on the inside of the drier will not be over 1.5 degrees. Now the conductivity of a cast iron shell, one and one-half inches thick will average 225 B.t.u.'s per square foot per degree difference per hour. The drop in temperature through a cast iron drier shell $\frac{2600}{225} = 11.5$ degrees, giving us a 1½ in. thick will, therefore, be

total drop through the water film and the shell of 13 degrees.

The actual outside surface temperature of a drier should, therefore, not be more than 10 to 15 degrees below the theoretical temperature of the steam on the inside. This 10 degree differential will, of course, graduate through the machine with around 15 degrees at the wet end and grading up to 5 degrees at the dry end. Observations of surface temperatures have proven that these figures will hold true in actual practice as well as theory and this fact can best be shown by reference to the following curves:

Curve 1 Showing Driers in Excellent Condition

This curve shows very clearly how closely actual conditions can check with theory. This drier section was transmitting around 2100 B.t.u.'s per square foot per hour and with the conductivity of cast iron at 225 and a drop through the water film of 1.5 degrees, we should expect to find a total average drop between steam temperature and surface temperature of about 10.8 degrees. The average drop as shown on the curve is 11 degrees. Aside from the temperature of driers three, four and six, this curve is ideal and shows all the driers right up to temperature. The temperature differential of 12 degrees on the wet end shows these driers to be working fairly hard. As the amount of water in the sheet decreases, the work on each succeeding drier decreases with a proportional increase in temperature until at the dry end, we have the last five or six driers doing practically nothing and within four



Curve 3

degrees of steam temperature. Take the sheet off this machine and all these driers will immediately come up to a temperature of 230 to 232 deg. F. and stay there. The harder a drier works, the lower will be its surface temperature. However, a 15 degree drop should take care of any average drier condition and if you find a temperature difference greater than this, you may feel sure that the drier is air bound.

Curve 2 Showing the Effect of Air in Driers

This is a hypothetical curve drawn to bring out the relation between steam temperature, drier temperature and the evaporation temperature. Aside from two abrupt drops, we have shown the drier surface temperature following a fairly smooth theoretical curve. The paper temperature or temperature of evaporation also follows a smooth curve running between 180 and 190 degrees until most of the water has been evaporated, at which point it rises sharply to 205 degrees. There are a number of interesting things to note.

First: Driers 12, 13 and 14 are slightly air bound and show a temperature of 12 degrees below normal. This drop does not show up on the temperature of the sheet because we still have 28 degrees temperature differential which continues to evaporate water although at a slower rate. The efficiency of these driers has dropped off in proportion to their heat head or a decrease of approximately 30 per cent. As was brought out previously; taking the temperature with a thermometer actually gives you the temperature of evaporation, and from this curve, it can be seen that it will not show driers out of order unless their temperature is below this temperature of evaporation. Dryers 24 and 25 are completely air bound and have dropped enough in temperature to come below the temperature of the sheet and, thus, have carried the sheet down with them. These are the only driers that would show up as being out of order, if the temperatures were taken with a hand thermometer.

Second: Cold driers such as shown by driers 24 and 25 really are not the greatest offenders, since they are so self evident and can be easily spotted. The greatest trouble will be found with driers which are only 5 to 10 degrees below normal temperature. It is impossible to spot these driers without the aid of a surface pyrometer. A very small drop seems unimportant but a decrease of seven degrees throughout the entire machine will reflect in a decrease in drying capacity of around 18 per cent. Here, then, seems to lie the real answer to our question of why some machines seem to dry so much better than others. A careful check of surface temperature is sure to reveal an unnecessary drop of from 5 to 20 degrees on many of the driers, and this in turn can, in most cases, be traced directly to air bound driers.

Curve 3 Showing Exceptionally Bad Conditions

This curve taken from actual operation gives some idea of just how bad conditions can be and yet get by unnoticed in the average mill. If these driers were put in shape, a steam pressure of ten pounds would probably have done the work nicely, whereas, they are using a pressure of thirty and fourteen pounds respectively. How many mills have conditions such as this and are not aware of it, is a question, but we believe that an actual survey would surprise us all.

Summary

Summing up the conclusions which we have drawn from our work on heat transfer.

1. Keep the driers clear of scale and rust inside and out.
2. Keep the sheet pressed against the driers as tightly as permissible.
3. Maintain enough circulation through the driers to carry away all the air.
4. Watch the surface temperature of the driers continuously in order to be sure that you are getting the best possible heat transfer.
5. See to it that every drier is up to temperature and not operating at a temperature of 5.7 or 10 degrees below normal. Remember that the average heat head between the drier surface and the evaporating temperature of the sheet is around 40 and that even a small drop of only 5 degrees has reduced the effectiveness of this drier 12½ per cent.

Corrosion Reduced by New Construction Materials*

By James A. Lee[1]

Corrosion is one of the most important problems of industry. All iron and steel, either in the form of equipment or buildings are destined to be destroyed by this agent of destruction. Since these metals are the most generally used materials of construction, their corrosion concerns industry more than that of others.

The annual corrosion bill is enormous. An estimate of the loss due to corrosion of metals in the United States, according to Dr. Gustav Egloff of the Universal Oil Products Company, is one billion dollars a year. When one considers that the country's business is estimated at 90 billion dollars annually, one realizes the heavy toll this scourge takes. Throughout the world the value consumed by corrosion aggregates over two billions. In the American oil industry alone, the corrosion bill for 1928 is estimated at 135 million dollars. This is equal to a levy of one cent on each gallon of gasoline consumed.

Process Industries Requirements

It has been estimated that the process industries, a group of establishments which utilize chemical engineering processes in the manufacture of their products, are annually using 750,000 tons of metallic products, the pulp and paper industry using 110,000 tons or approximately 15 per cent of the total. A very large portion of this represents a replacement of equipment which has failed through wear and corrosion after serving one to twenty years. But the estimated consumption of high chrome iron and steel in the process industries is about 12,000 tons, of which the pulp and paper industry uses 600 tons.

The acceptance of chrome and chrome-nickel alloys indicates that their use will rapidly increase. The rate of increase is, of course, a matter of conjecture. However, those industries which have the most need and have shown the greatest inclination to use this material may be rated according to the estimated consumption.

Industry	Present Tonnage Consumption per cent	Estimated Ultimate Tonnage Construction per cent
Petroleum refining	25	15
Chemicals	15	28
Automotive	20	8
Architecture	15	8
Sulphite pulp mills	5	6
Food processing and service	12	18
Textile	3	5
Laundry	1	4
Marine	1	4
Aviation	1	2
Electrical appliances	2	2
Total	100	100

Because of the variety of processes used for the production of paper and the variety of chemicals used in each, the pulp and paper industry is in a peculiarly unfavorable position as regards corrosion. In Chairman J. D. Miller's report, a year ago, he stated that as the result of a canvas of the sulphite mills the estimated value of the corrosion loss, expressed in dollars per year per ton daily production, was $98.75. The labor charges and loss in production are not included in this figure. This means that the annual corrosion bill of a plant with a capacity of 575 tons would be $60,000. But the sulphite mill is not the only one which has its corrosion losses. A soda mill making 50 tons of book paper daily spent in 1929 approximately $12,000 for replacing valves and fittings. This mill purchased in that year 17,390 feet of black and galvanized iron pipe in sizes from ½ inch to 15 inches, as well as 625 valves. And in addition to the losses from chemical corrosion there is a large loss due to atmospheric corrosion which shortens the life of tanks, equipment and buildings.

Chrome-Nickel Ferrous Alloys

During the past two or three years the 18 per cent chromium, 8 per cent nickel, ferrous alloy has become increasingly popular among sulphite mill men, and today its applications include centrifugal pump casings, shafting and impellors; and valves. Seamless tubing has been adopted in many mills for handling hot sulphite liquor, piping for sulphur-burning equipment, and in some instances sleeving has been used to cover shafting where it runs through a corrosive solution. Plates on the top locking covers of the digestors, and blow pit drainer bottoms made of the alloy have been almost universally adopted. And other applications include blow pit linings, circulating systems, flow lines, acid tanks, acid heaters and beater bars. Attempts have been made to use it for Fourdrinier wire. While it has increased the life of the wire it has not yet increased it enough to justify the additional cost.

Digester Construction

For several months three or four experimental and one small commercial sulphite digester made of the 18-8 alloy have been in operation. And it is expected that a large digester, now in the process of being fabricated, will be in operation within 30 days. It is reported that in Finland, there are two or three sulphite digesters lined with this alloy that have given satisfactory service for several years.

There is probably little doubt left in the minds of most engineers that the 18-8 alloy is valuable for resisting the corrosion in sulphite mills. Engineers realize that in cases where equipment, fabricated of this metal, has failed in a short period of time, the failures have not been due to the chemical formula of the alloy, but to the lack of knowledge of its characteristics by the producers, fabricators and paper mill engineers. Improper heat treatment and stress resulting in intercrystalline corrosion and disintegration of the metal and porous castings account for most failures. As an example of this is a circulating system installed in a

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Wisconsin pulp mill which failed after two months service because the fabricator did not follow foundry instructions in connection with the bending of the pipe and the elimination of stresses during the erection. The foundry subsequently fabricated the entire circulating system at its plant to actual blue-print dimensions so it could be erected without any undue stress, and the material functioned perfectly for a period of two years, at the end of which time there was no evidence of corrosion.

A small percentage of failures must be expected until more knowledge of the characteristics of the 18-8 alloys can be obtained. And this can only be gotten from experience which will require the cooperation of all interested parties.

Krupp Alloys

The straight 18-8 alloy first placed on the market may not be the most resistant alloy to sulphite corrosion attainable. Producers have attempted to improve sulphite resistance by modifying the chemical formula. An alloy with a few per cent of molybdenum, such as the Krupp interests have developed, has been in use, in many mills, for some time and it is generally supposed to be superior to the straight 18.8. There are some cases where its additional resistance to corrosion justifies the added cost. Recently this alloy has been still further modified by a reduction in the carbon content to less than 0.07 per cent. It is claimed for this material that it requires no heat treatment after welding.

In the interest of further improving the high-chrome, high-nickel alloy for use in resisting the chemicals encountered in the sulphite industry, steel manufacturers have brought out an alloy which contains slightly higher percentages of both of the above elements. The table gives the results of tests on this modification which V. B. Browne and C. A. Scharschn of the Allegheny Steel Company have made. Since these were only the results of a few laboratory tests they can not be considered conclusive proof of the suitability of the alloy for use in resisting sulphite corrosion; however, these tests indicate that this alloy may supply the industry with a material of construction that will be an improvement over any now available.

1% SODIUM BISULPHITE—3% SULPHUROUS ACID
Temperature—300 deg. F. Pressure 50-55 pounds per sq. in.

C	Cr	Ni	Mo	Loss per sq. in. per hr.
0.13	17.39	8.39	..	0.511 milligrams
0.12	20.39	10.76	..	0.182
0.13	17.74	8.30	2.0	0.347

Applications for Carbon

In addition to chrome-nickel alloys, carbon is one of the most recent and interesting materials to be used for the construction of process-industry equipment. It is being used successfully in pyrolytic process phosphoric acid, contact sulphuric acid and other heavy chemical plants. At first glance carbon might seem to be a material which could play no part in pulp and paper manufacture, but it has been found that the low coefficient of friction, chemical inertness, and the wide range of sizes and shapes in which it can be made fits it for service in a number of places in this industry.

Most of the mechanical applications of carbon revolve about the coefficients of friction and expansion or lubricating value and its ability to be ground into a closely fitting joint. These qualities come into play in the use of carbon rings for obtaining tight joints in steam connections to paper-machine drying cylinders. Each joint contains a carbon ring, about 7 in. o.d. x 4 in. i.d. x $\frac{5}{8}$ inch thick, fitted to the journal of the revolving cylinder and bearing against a bronze or brass ring on the stationary journal bearing, through which steam is admitted to the cylinder. Sometimes a pair of carbon rings is used instead of a metal to carbon contact. These mated rings are said to assure a very close fit by revolving against each other under spring compression, so that there is not the slightest escape of steam under normal working pressures. One of the largest paper mill machinery manufacturers, who holds a patent on this application of carbon, has used these rings for several years.

A recent development in paper-machine operation is the proposed substitution of carbon for wooden suction-box covers. The carbon covers follow the same general pattern of wooden covers being made of fitted sections of carbon plates perforated with holes over the suction area and bolted to the box rails.

Reasoning from the analogy of the low wear on copper commutators by carbon motor brushes, it is believed that the use of carbon suction-box covers will considerably increase the life of Fourdrinier wire, and result in other advantages such as reducing driving power consumption and suction-box maintenance costs.

This application has been in course of evolution for several years, but its actual commercial application has awaited the development of a practical machine for initial and periodical surfacing of the carbon covers. The new planing machine is said to produce an absolutely true and highly polished surface on the cover. A complete set of these carbon suction-box covers is now undergoing a trial in a mill of one of the large paper companies, and so far the results obtained look very favorable.

Digester Lining

Digester linings are the object of considerable concern by pulp producers. The ceramic linings now in use must be renewed at frequent intervals ranging from 6 to 9 years, because of their susceptibility to spalling and chemical disintegration. This imposes a troublesome maintenance problem, because of the high cost of replacements and interference with production. It is believed that carbon is entirely unaffected by the chemical reactions occurring in pulp digesters, and that its elasticity and unusual resistance to thermal shock is comparable to that of ceramics. For these reasons, a lining composed of carbon bricks set up in a manner quite similar to that of the present practice should render a life equal to that given by ceramic materials.

Entire Carbon Linings Considered

Complete carbon digester linings have not as yet been installed, but the result of trials under accelerated and actual conditions have been so favorable, that entire carbon linings are being actively considered for both sulphite and kraft digesters. Several large size patches of carbon bricks inserted into the ceramic linings of sulphite and kraft digesters have been under close observation for upwards of a year. To date there has been practically no sign of corrosion or erosion on the surfaces of the carbon patches which are entirely unchanged.

Also the sharp machined edges of the carbon bricks attest to a complete absence from spalling, which might be induced by thermal stresses.. Samples of carbon blocks subjected to highly accelerated digester conditions for two or three hundred hours exhibit no change in their condition, beyond a moderate gain in weight due to the absorption of calcareous salts.

The promising results obtained so far in pulp digesters has suggested the use of carbon in other pieces of equipment operating under more or less difficult corrosion conditions in pulp and paper mills. Among these are blow pit linings, vomit stacks, blow pit strainers and sills, sulphite liquor-storage tanks and stock chests.

Conclusion

In closing it should be emphasized that the development of new materials to resist corrosion, and their adaptation to the requirements of a particular industry, demands the hearty cooperation of manufacturers and users alike. This is necessary since the laboratories have not as yet developed methods of tests that can be relied upon to do more than indicate whether a material will be suitable. The only truly reliable method is an actual mill test on a commercial scale, and to do this the manufacturer, obviously, needs the assistance of the pulp and paper mill engineers.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

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Raw Materials

Penetration Studies of the Path of Liquid Penetration in Jack Pine. W. Wyatt Johnston and Otto Maas. Can. J. Research. 3, 140-173 (Aug. 1930).—Quantitative measurements were made, for the first time, of the rate at which liquids penetrate into woods in terms of the velocity normal to the wood-liquid interface. The effects upon this rate of species, previous history, structure, orientation, thickness, nature of liquid, pressure head, temperature and times were examined and measured. It was found that wood behaves largely in a reversible manner, provided the treatment does not alter its structure. A technic was devised for maintaining a single chip in a unvarying environment and following the progress of the cooking process by the variation of the rate of flow of the cooking liquor through the specimen. An attempt is made to examine flow in wood from the standpoint of hydraulics, and a structure is suggested which agrees well with existing anatomical information and gives values for resistance to flow which compare favorably with experimental values.—A.P.-C.

Sinkage Studies. IV. The Mechanism of the Absorption of Water by Wood Blocks. George W. Scarth. Can. J. Research 3, 107-114 (Aug. 1930).—Uniform blocks of white pine wood were allowed to absorb water under various conditions of external and internal pressure, and in the presence and absence of air. The results shown graphically give some idea of the quantitative relation existing between penetration of water into wood and the various forces operating. It is concluded that the rate of penetration of water into an immersed block of coniferous heartwood is fixed by the rate at which the air in the block can dissolve and diffuse out. Applied to log sinkage, the findings show that under most conditions the limiting factor is the rate of escape of air from the log.—A.P.-C.

Composition of Cassia Siamea. L. Y. Shinoda. J. Cellulose Inst. (Tokyo) 6, 155-156 (1930).—The following composition was found: moisture 11.2 per cent, alcohol-benzene extract 18.2 per cent, lignin (König) 37.3 per cent (on the extracted dry product), ash 0.3 per cent, impure cellulose 40.3 per cent, hydrolysis value (Ost) 92.8 per cent, pentosan (Tollens-Krüger) 15.6 per cent. Before chlorination the wood metal was steeped in 10 per cent sodium hydroxide solution for 28 hours and its cellulose content redetermined, when the value of 33.8 per cent of purity 100 per cent, was found. Xylose and mannose were found in the hydrolysis liquor, but no galactose was present.—A.P.-C.

Chemistry of Wood. II. Water-Soluble Polysaccharide of Western Larch Wood. Louis Elsberg Wise and Floyd C. Peterson. Ind. Eng. Chem. 22, 362-365 (April 1930).—The water-soluble galactan of western larch, described by Schorger and Smith in 1916, yields 11.95 per cent of arabinose and 84.6 per cent of galactose on complete hydrolysis and appears to be an arabogalactan. Over 70 per cent of the galactose present, as indicated by analysis, could actually be separated in crystalline form. The arabinose was identified through its benzylphenylhydrazone and the diphenylhydrazone.—A.P.-C.

Chestnut Lignocellulose. J. H. Ross and A. C. Hill, Research Notes, 2, 37 (1929); Pulp Paper Mag. Can. 29, 453 (March 27, 1930).—Chestnut sawdust was progressively extracted with 8 volumes of boiling 1 per cent caustic soda solution, for periods up to 43 hours, and the lignin was determined in the residues obtained. The final residues (after 24 hours' treatment) is almost completely resistant to the solvent action of the alkaline solution; and there is apparently a definite ratio of lignin to cellulose in this wood, the cellulose and lignin being in the proportions of $(C_6H_{10}O_5)$ + lignin if lignin has a formula close to $C_{28}H_{36}O_{12}$ for its unit.—A.P.-C.

Hard Woods for Soda Pulp. E. Sutermeister. Paper Mill 53, No. 27, 16, 24 (July 5, 1930); Paper Trade J. 91, No. 2, 57-58 (July 10, 1930).—Laboratory tests on white maple, beech, white and yellow birch, red-heart birch and black gum showed that they cooked nearly as easily as poplar under the same conditions of treatment, but that in most cases the fiber was harder to bleach, the bleach required to give the standard color ranging from 2 to 8 per cent on the weight of fiber. When made into paper, white maple fiber is practically the equivalent of poplar, while gum and birch fibers are superior in some ways. As compared with poplar, gum seems to give greater bulk and strength, while birch gives a rather firmer and more leathery-feeling sheet. From discussion of practical considerations, the author shows the advantages of the use of hard woods and concludes that their treatment is practically the same and no more difficult than that of poplar, except that they may cut harder and in some cases are more difficult to peel.—A.P.-C.

Evaluation of Pulpwood. Bjarne Johnsen and Charles H. Reese. Paper Trade J. 91, No. 11, 66-68 (Sept. 11, 1930). Paper Mill 53, No. 37, 4-5, 8 (Sept. 13, 1930).—Results of series of laboratory-scale (5-liter digester) cooks on a number of samples of spruce and balsam from different sources are described and discussed, showing that it is possible to adjust cooking conditions so as to obtain optimum results as to yield and quality of pulp, and that from the yield of pulp per unit volume of wood and from the physical and chemical properties of the pulp produced, the relative price at which wood for pulp production should be purchased from any source can be determined.—A.P.-C.

Western Hemlock. C. R. Berry. Paper Trade J. 91, No. 13, 38, 40 (Sept. 25, 1930).—A brief discussion of its suitability as a pulpwood.—A.P.-C.

Rayon as a Paper Making Material. Merle B. Shaw and George W. Bicking. Paper Trade J. 91, No. 10, 65-67 (Sept. 4, 1930).—The results of laboratory tests in which the four principal kinds of rayon were subjected to the same treatment as paper-making rags indicated that rayon is not suitable for use as a paper-making fiber.—A.P.-C.

Bamboo. W. G. E. Haussecker. Paper Maker & Brit. Paper Trade J. International No., 49-53 (1930).—A discussion of its possibilities as a substitute for coniferous woods for the manufacture of pulp and paper.—A.P.-C.

Physical Structure of Cornstalks and Wheat Straw. R. E. Lofton. Paper Trade J. 91, No. 5, 39-44 (July 31, 1930).—A description of the physical structure of cornstalks and wheat straw, illustrated by drawings and microphotographs, together with microphotographs and dimensions of four kinds of chemical wood fibers of industrial importance for the purpose of comparison.—A.P.-C.

Power Alcohol and Paper from Rice Straw. D. D. Deshpande. J. Indian, Inst. Sci. 13A, 93-109 (1930).—Rice straw was examined as a possible source of power alcohol. With dilute sulphuric acid as the hydrolyzing agent, the best results were obtained by digesting with 5% of acid (calculated on the weight of the straw) at 5 atmospheres for 1 hour. The residue (60 per cent) was largely cellulosic matter and was converted into paper pulp of good quality. The whole process gave 20 to 25 gallons of liquid, most alcohol, and 8 cwt. of paper pulp from 1 ton of straw.—A.P.-C.

Paper from Cornstalks. Lionel K. Arnold. Cellulose 1, 224-227 (Oct. 1930).—A brief discussion of the advantages of cornstalks as a raw material for paper pulp and review of the results obtained at Iowa State College on the pulping of cornstalks, particularly by the soda process.—A.P.-C.

Cellulose and Lignin

Relationship Between Alpha Cellulose Content and Potassium Hydroxide Solubility of Certain Degraded Cellulose. H. LeB. Gray, C. J. Satud and J. T. Fuess. Ind. Eng. Chem. 22, 1018-1020 (Sept. 1930).—Series of oxidized celluloses and of hydrocelluloses were prepared using acidic potassium permanganate and hydrochloric acid solutions, respectively. The alpha-cellulose content and solubility in hot 10 per cent potassium hydroxide solutions were determined The relationship $y^2 = 697 \div 45x - 0.526x^2$ (in which x is the alpha-cellulose content and y is the potassium hydroxide solubility) was found to hold satisfactorily in both series when the alpha-cellulose content was 75% or greater. The curve expressing this relationship is given.—A.P.-C.

Decomposition of Cellulose and Cellulosic Material by Bacteria. A. M. Buswell and C. S. Boruff. Cellulose 1, 108-110 (May), 162-165 (July, 1930).—A brief review.—A.P.-C.

Cotton Cellulose: A Special Form of Cellulose. A. J. Hall. Cellulose 1, 176-178, 194 (Aug. 1930).—A brief discussion of cotton fibers in relation to the re-activity of the cellulose of which they are composed.—A.P.-C.

Caustic Alkalies and Cellulose. A. J. Hall. Cellulose 1, 118-120 (May), 144-148 (June 1930).—A discussion of the effects of caustic soda and of caustic potash on viscose and of the increased re-activity of cellulose produced by treatment with alkali.—A.P.-C.

On the Celluloses from Different Natural Sources. I. Naohiko Matsunami. J. Soc. Chem. Ind. Japan 33 (Supp. Binding), 292-293 (Aug. 1930).—The author examined the hypothetical theory that the celluloses from different sources are composed of the same chemical units in the same state of aggregation. The sources of the cellulose studied were wood pulp prepared from Todomatsu (*Abies saccharinensis,* Masters), grown at Naibuchi, Karafuto, by cooking with sulphite liquor on a manufacturing scale at the Hokuetsu Seishi Co., Nagaoka; Kaoliang culms (*Andropogon sorghum,* Broth) grown in Manchuria; and the crude fibers from ramie or China grass (*Boehmeria nivea,* Hook and Aru) grown in Taihoku, Formosa. From these raw materials the unbleached celluloses were prepared by the Cross and Bevan method by the chlorine dioxide method proposed by E. Schmidt. The wood pulp differs in composition from the ramie fiber-substance, which was assumed to be composed mostly of alpha-cellulose, and the kaoliang fiber is a furfural-yielding complex which appears to be hemi-cellulose composed mostly of xylan. The impurities or associated substances which occur in cellulose fibers together with alpha-cellulose might have some influence on the physical and chemical properties of alpha-cellulose. The adsorption capacity of bleached cellulose for alkali may be taken as a measure of the difference in the chemical nature of their constituents. The wood and kaoliang celluloses produced alkali cellulose corresponding to the formula $(C_6H_{10}O_5)_2$. NaOH, while the ramie cellulose adsorbed caustic soda to the amount of a molecular ratio corresponding to $(C_6H_{10}O_5)_3$. NaOH. The difference between bleached celluloses in their affinity for alkali or dyestuffs may be explained by a difference in the physical state of the surface of the cellulose. The celluloses after mercerizing with caustic soda solution are, in general, characterized by their high alpha-cellulose content: the ramie cellulose is distinguished from the others by its high oxy-cellulose content, the wood cellulose by its high lignin content as indicated by the reducing action, and kaoliang by the furfural-yielding substances. The action of superheated water, being regarded as an agency comparable to that at work in nature, was investigated in order to get some idea of the difference between alpha-cellulose obtained from the different fibers. The portion of the cellulose undissolved by superheated water was found to consist mostly of alpha-cellulose. It was analyzed and the results were compared with those obtained in the case of the mercerized celluloses. The most marked difference noticed in these insoluble residues from the three bleached celluloses was in the alpha-cellulose and furfural-yielding substance contents, and the same was also met with in the mercerized celluloses. As a matter of fact, the crude fibers prepared from different sources were diverse in their properties and on purifying them tended to approach to some extent, a chemically identical substance.—A.P.-C.

On the Celluloses from Different Natural Sources. II. Naohiko Matsunami. J. Soc. Chem. Ind. Japan 33 (Supp. Binding), 294-295 (Aug. 1930).—To eliminate the non-cellulose constituents from bleached ramie and wood cellulose, they were treated with 12.5% and 4% caustic soda solution, which gave an alpha-cellulose of high purity with a 5.9% loss in weight. Bleached kaoliang cellulose was treated with 4%, 12.5% and 17.5% caustic soda solutions in succession to eliminate the non-cellulose constituents, and the yield of alpha-cellulose was about 84%. The purity of the cellulose was about the same in each case, and they showed similar behavior towards dyestuffs and strong alkali solutions, and also similar results with regard to the specific viscosity and the specific rotatory power and the hydrolytic velocity. It was noted that the kaoliang alpha-cellulose, containing 99% of alpha-cellulose, is especially resistant to the action of oxidizing and hydrolytic agents. The main difference in the cellulose from wood pulp, ramie and kaoliang is in the resistance to hydrolysis and oxidation, which seems independent of the presence of the furfural-yielding residue left in the pulp even after severe cooking and bleaching treatments. A small quantity of the furfural-yielding substances remains in the kaoliang pulp, which is unaffected by bleaching, and the amount of these substances is much less than the loss of alpha-cellulose by the action of superheated water. Kaoliang cellulose is therefore especially affected by this treatment, being converted into a soluble substance. Thus, alpha-cellulose from three different sources shows quite different behavior toward superheated water, in spite of the fact that they contain the same amount of the major characteristic constituent (99.5 to 99.8% alpha-cellulose). The attempt to prove that purified celluloses are chemically identical therefore fails, since alpha-cellulose differs in the resistance to the action of superheated water. It has not been determined whether the difference in the behavior of alpha-cellulose to superheated water is to be attributed to a difference in the mode of aggregation of the $C_6H_{10}O_5$ units in the molecule or to a difference in the configuration of the atomic groups in the unit.—A.P.-C.

Cellulose from Difference Natural Sources. III. Naohiko Matsunami. J. Soc. Chem. Ind. Japan 33 (Supp. Binding), 295-

296 (Aug. 1930).—Alpha-celluloses obtained from ramie todomatsu and koaliang were dissolved in cuprammonium solution and then precipitated by dilute sulphuric acid, and the properties of the regenerated alpha-cellulose were studied to try to obtain some idea of the mode of aggregation of the chemical unit of cellulose. The regenerated alpha-celluloses were similar in their chemical and physical properties, but differed in their behavior toward snperheated water, which shows that the mode of aggregation of the $C_6H_{10}O_5$ units in the kaoliang cellulose molecule is not the same as in the lapha-cellulose from wood and from ramie, nor as that in normal cellulose from cotton. Alpha celluloses from the different natural sources, regenerated from their acetyl derivatives by saponification, were found to have the same properties, so far as they have been studied, but they had different rotatory powers according to the fractions of the acety-alpha-celluloses from which the alpha-celluloses were regenerated. The experimental data accumulated in this and the two previous reports justify the conclusions that the alpha-celluloses from ramie, todomatsu and kaoliang probably do not contain the cellulose unit in the same state of aggregation. The results considered as a whole are in favor of the view that the alpha-cellulose isolated from ramie is made up to a group or unit more resistant and the greater part of alpha-cellulose isolated from kaoliang is made up of a unit less resistant to the action of oxidation and of superheated water. The triacetyl-alpha-celluloses derived from the different alpha-celluloses exhibited similar chemical compositions, and physical and chemical properties, and experimental results obtained so far seem to favor the hypothesis that the cellulose from different sources are built up of a chemically identical unit.—A.P.-C.

Viscosity of Fibrous Cellulosic Material in Cuprammonium Hydroxide Solution. John L. Parsons, Cellulose 1, 200-203 (Sept. 1930).—A review of recent developments and particularly their significance to the pulp and paper industry, with bibliography of 14 references.—A.P.-C.

Behavior of Cellulose with Bisulphite as Compared with Sulphurous Acid Solution. T. Nakashima, S. Ohora and J. Murakami. J. Soc. Chem. Ind. Japan 33 (Supp. Binding), 199-200 (1930).—In both cases after heating for 24 hours at 100°C. no change in iodine value or acid value, or separation of sulphur was observed; hydrolysis of the cellulose was slight, but dissociation occurred especially with sulphurous acid. Bisulphite-cooked cellulose diminished in viscosity with time of heating, but the increase in the copper number and the proportion of beta- and gamma-cellulose was small. On the other hand the sulphurous acid cook diminished the viscosity enormously and caused a distinct increase in beta- and gamma-cellulose, but the increase in copper number was not great, scarcely any sugar being formed.—A.P.-C.

Cuprammonium Viscosity of Cotton Cellulose as Related to Paper Making. H. W. Bailkowsky. Paper Trade J. 90, No. 11, 53-58 (March 13, 1930); Paper Mill 53, No. 13, 16, 18, 22, 24, 30 (March 29, 1930).—The capillary cube method of the Shirley Textile Institute for determining the cuprammonium viscosity of cellulose materials is a simple and convenient method and can be readily applied to routine work. In the processing of rags for paper making, the cuprammonium viscosity is considerably decreased by the cooking and bleaching operations and to an inappreciable extent by washing and ordinary beating. The lowering of viscosity due to bleaching is a convenient method for detecting loss in folding resistance and it is probable that a drop in cuprammonium viscosity is always accompanied by a loss in strength of the cellulose fiber. The classification of rag fibers with respect to strength by means of cuprammonium viscosity seems to agree with the classification set up by experience.—A.P.-C.

Apparatus for the Determination of Viscosity of Cellulose in Cuprammonium Solution. Fritz Brauns. Paper Trade J. 91, No. 13, 51-52 (Sept. 25, 1930).—An all-glass apparatus is described, which is constructed so that solution of the cellulose in the cuprammonium solution and determination of the viscosity of the cellulose solution is carried out entirely in the absence of air which is displaced by nitrogen. It is particularly suitable for control work, as the determination requires only about 25 to 30 minutes.—A.P.-C.

Distillation Products of Cellulose. H. B. Arbuckle and H. S. Davidson. J. Elisha Mitchell Sci. Soc. 45, 147-149 (1929).—A.P.-C.

Determination of Lignin by Means of Formaldehyde and Sulphuric Acid. II. J. H. Ross and J. G. Potter. Research Notes 2, 49-51 (1929); Pulp Paper Mag. Can. 29, 569-571 (April 24, 1930).—Difficulty in filtering the lignin precipitate obtained by the previously described technic, Pulp Paper Mag. Can. 27, 541-544 (April 11, 1929), is overcome by mixing the formaldehyde-acid (35 cc. of a 6:1 mixture), and then evaporating the chloroform. For pulps, use a 1.25-g. sample and increase the amount of reagents proportionately, but use only 35 cc. of the chloroform-acetic mixture. The amount of lignin recovered by evaporating the chloroform under vacuum at low temperature is the same as that obtained by the method as originally given and is higher than by evaporating on the water bath or over a flame, confirming that the lignin value is lowered by heating the precipitate in the presence of mineral acids. Mahood and Cable, Ind. Eng. Chem. 14, 934 (1922). Attempts to neutralize the sulphuric acid before evaporation of the chloroform gave inconclusive results.

Mechanical Process

Recording Instrument for Controlling the Feed of Wood Grinders. Anon. Papier 53, 857-861 (Aug. 1930). A description of the "maxigraph" and its application for recording the feed of grinders. The instrument is constructed so as to give the average feed (in mm. per min.) of continuous grinders for a given period, which may be adjusted as required (say, every 5 or 10 min.), instead of giving the instantaneous rate of feed at every moment.—A.P.-C.

Artificial Stones in Groundwood Pulp Manufacture. Joseph H. Slater Paper Trade J. 91, No. 1, 54-55 (July 3. 1930); Tech. Assn. Papers Series 13, No. 1, 245-246 (May 1930); Paper Maker & Brit. Paper Trade J. 80, 165-168 (Aug. 1, 1930).—A discussion of the superiority of modern artificial stones over natural stones for the production of groundwood.—A.P.-C.

Introduction to Scientific Pulp Grinding. Bernard Bornstein. Pulp Paper Mag. Can. 30, 133-134, 150 (July 31, 1930).—A discussion of some of the main factors involved in modern grinding practice.—A.P.-C.

Magazine Grinder for Wood Pulp. Ambrose H. White. U. S. pat. 1,754,536, (April 15, 1930).—The charge of wood in the magazine is divided into a number of batches by means of cross bars or beams, secured to the endless travelling chains so as to lie close to the walls of the magazine and to engage with the ends of the logs. The magazine is preferably slightly wider at the bottom than at the top. To reduce to a minimum the friction of the log against the sides of the magazine, anti-friction walls are provided at the lower end of the magazine, consisting of a series of chain links with their ends secured to the walls and a series of rollers rotatably mounted on the link pins, preferably in staggered relation.—A.P.-C.

Pocket Pulp Grinder. William A. Whitcomb assignor to Great Northern Paper Co., pat. 1,757,031, (May 6, 1930).—On each pocket is mounted a small vertical magazine or hopper which can hold the amount of wood required for a single charge for the pocket. The top of the hopper is opened; the bottom is normally closed by a sliding door which forms the bottom wall of the hopper and the top wall of the pocket. When the pressure foot in the pocket nears the end of its downward course and the charge is nearly all ground, it is automatically retracted;

when it nears the opposite end of its course the sliding door is automatically opened to let the charge of wood fall from the hopper into the pocket and the door is automatically closed before the pressure foot exerts any material pressure on the fresh charge in the pocket. The hoppers are charged by hand. —A.P.-C.

Alkaline Processes

Recovery of Resins from Black Liquors. K. G. Bergstrom. Fr. pat. 663,416, (April 8, 1929).—The resins are isolated by treating with sulphuric acid, with agitation and then treating with a solvent, first cold and then hot, which is separated by decantation.—A.P.-C.

Process for Purifying Oils Obtained in the Manufacture of Pulp. Societe Meusienne de Produits Chimiques. Fr. Pat. 666,728, (Jan. 5, 1929).—The oils obtained as by-products in the manufacture of pulp have proved unsuitable for soap making on account of their disagreeable odor and of their relatively high content of unsaponifiable matter. According to the invention the hot crude oils are washed with a cold acid and then dried completely. It is then hydrogenated in presence of a catalyst. The hydrogenated oil distillation can yield 75 to 80 per cent of saponifiable oil, the residue remaining in the retort consisting of tarry and unsaponifiable matter.—A.P.-C.

Reclaiming of Lime from Caustic Sludge. G. M. Trostel. Paper Mill 53, No. 23, 12, 30 (June 7, 1930). World's Paper Trade Rev. 94, 246-248 (July 18, 1930).—A brief discussion of the more important factors in the operation of reclaiming lime from carbonic sludge.—A.P.-C.

Alkali Recovery from Pulp Liquors. C. L. Wagner. World's Paper Trade Rev. 93, 842-848, 898, 900 (March 7, 1930).—A brief description of the Wagner furnace and its operation, with a discussion of the various problems encountered in its development; structure, lining, roof, boiler, scrubber, spraying, air supply (points of introduction and permissible gas velocities), chemical reactions, temperature for most effective performance, capacity and basis for calculation.—A.P.-C.

By-Products Recovery in the Digestion of Cellulosic Materials. Gustaf Haaglund. U. S. pat. 1,772,251 (Aug. 5, 1930).—A sulphate such as sodium sulphate is decomposed electrolytically into a cathode solution of alkali hydroxide and an anode solution of sulphuric acid. the alkali hydroxide is treated with sulphur compounds such as sulphur dioxide to form a suitable liquor for boiling, and the cellulosic material is boiled in the solution thus prepared. The cellulose is separated from the spent liquor and the anode solution of sulphuric acid added to the liquor.—A.P.-C.

Recovering Alkali Metal Compounds from Waste Liquors. C. L. Wagner, Eng. pat. 321,413 (Aug. 7, 1929).—Waste liquors from the manufacture of pulp are burned to recover soda, etc., and to obtain hot gases which may be used to generate steam. Various details of apparatus are described, in which the sodium sulphate present in the liquor may be reduced to sulphide.—A.P.-C.

Method of Treating and Utilizing Soda Black Liquor. Erik Haaglund. U. S. pat. 1,772,216, (Aug. 5, 1930).—Black liquor is cipitate as solid carbonaceous and pitchy material the main portion of organic substances present, the liquid is then separated from the precipitate and at least a portion of the liquid is evaporated to dryness and the residue is subjected to dry distillation with recovery of volatile products such as methyl alcohol.—A.P.-C.

Sulphate Recovery Process. William D. Mount assignor of one-half to Kenrick A. Forrest. U. S. pat. 1,754,902 (April 15, 1930).—The use of a smelting furnace is completely eliminated by burning the concentrated black liquor to a complete black ash in the incinerator or rotary furnace and reducing the salt cake or sodium sulphate to sodium sulphide in a rotary kiln along with the conversion to calcium oxide of the calcium carbonate of the caustic sludge. By proper control of the kiln operation, some of the sodium sulphate may at the same time be converted into sodium carbonate, thus making up for the inevitable loss of caustic soda in the process.—A.P.-C.

Continuous Sulphate Recovery Process. William C. Munro assignor to William D. Mount. U. S. pat. 1,756,432, (April 29, 1930).—The process includes cyclic re-utilization of the alkali compounds of the spent cooking liquor for the production of fresh cooking liquor, and also the cyclic re-utilization of the causticizing lime. It includes continuous clarification of the green liquor by decantation, continuous causticizing of the green liquor, continuous separation of the white liquor from the lime sludge, continuous filtering and washing of the lime sludge, continuous burning of the sludge to quicklime and continuous slaking of the burnt lime.—A.P.-C.

Lime Recovery From Sludge. Carlie L. Crain. Paper Mill 53, No. 15, 16, 18 (April 12, 1930).—A brief description and discussion of the lime-recovery system in use at the sulphate mills of the Southern Division of International Paper Co. A 7 x 120 ft. kiln, with draft at base of stack 0.3 in., average fluegas temperature of 400° F. and sludge at 45 per cent water, are considered to be the best conditions for the production of 30 tons of reburned lime 24 hours.—A.P.-C.

Some Notes on the Recovery of Soda. J. A. Walker. World's Paper Trade Rev. 93 (1209-1220) (April 4, 1930); Paper Maker & Brit. Paper Trade J. International No. 94, 98 (1930); Paper Mill 53, No. 26, 15-16, 19-22 (June 28, 1930).—A discussion of the principal sources of leakage of alkali in the recovery of soda from esparto mill black liquor.—A.P.-C.

Evaporators for Black Liquor. Martin J. Kermer. Paper Mill 53, No. 24, 20-22 (June 14, 1930).—A brief discussion showing that evaporators must be designed to meet the particular conditions of each case and outlining some of the principal characteristics of evaporators designed by Buffalo Foundry and Machine Co., to meet certain conditions in black liquor concentrations.—A.P.-C.

Cooking Process. II Cooking Wood With Sodium Carbonate. S. I. Aronovsky and Ross Aiken Gortner. Ind. Eng. Chem. 22, 941-945 (Sept. 1930).—Aspen sawdust was cooked with 20 and 40 per cent sodium carbonate (based on the weight of the oven-dry wood) at temperature of 170° and 186° C. and for 2 and 12 hours. The residues were analyzed for lignin, pentosans, cellulose and alpha-cellulose. Total organic matter volatile acids (as acetic acid), and lignin (by 72 per cent sulphuric acid) determinations were made on the residual black liquors. The results of these analyses were compared with those obtained by cooking wood with water only, and it was found that under the conditions employed, sodium carbonate has a considerable effect on the resultant yields of residual wood and its main constituents. Sodium carbonate cannot therefore be considered as an inert ingredient in a cooking liquor.—A.P.-C.

Production of Paper Pulp. John Neumann. U. S. pat. 1,775,-405 (Sept. 9, 1930).—In the manufacture of pulp from wood, straw, stalks, etc., the material is reduced to small pieces and these are immersed in a solution containing sodium silicate and caustic potash. Sodium sulphide is subsequently added and the materials are boiled together.—A.P.-C.

Pulping Fibrous Material Such as Straw. Sidney D. Wells assignor to The Mine and Smelter Supply Company. U. S. pat. 1,769,811, July 1, 1930.—The material is soaked in a cold caustic alkali solution and subjected to treatment in a rod mill to obtain pulp.—A.P.-C.

Wood Pulping Process. George E. Rice assignor to Conversion Corporation of America. U. S. pat. 1,769,189 (July 1, 1930).—Wood is boiled in water containing a substantial proportion of carbohydrate material such as a solution of sugar, sodium nuoride, sodium carbonate and sodium sulphite, until no

further scum rises to the surface, and the material is then bleached.—A.P.-C.

Sulphate Process and Kraft Paper. George Voght. Pulp Paper Mag. Can. 29, 799-880, 806 (June 12, 1930).—A brief description of the sulphate process.—A.P.-C.

Production of Cellulose from Sugar Cane Fiber. J. J. de la Roza. Eng. pat. 322,763, (June 30, 1928).—The material is crushed, washed in hot water and treated with an aqueous solution containing 4 to 5 per cent of sulphur dioxide to prevent the growth of injurious micro-organisms; the fiber is then cooked with alkali, washed and bleached.—A.P.-C.

Study of the Utilization of Maritime Pine Wodd for the Manufacture of Paper Pulp. Karl Bergstroem. Paper 32, 283,-287 (March), 399-401 (April 1929); 33, 383-387 (April), 633-639 (June 1930).—Estimates are made of the cost of construction and operation and of the total sales and profits of a 100-ton mill for the production of pulp from Maritime pine in France, using the straight sulphate or soda process without recovery of by-products, using the Ankschourine process, using the by-products recovery process in general use in Scandinavia, and using the Rinman process. The estimated profits are given as 22.3 per cent, 33 per cent, 41 per cent and 45 per cent, respectively.—A.P.-C.

Sulphite Process

Manufacture of Liquid Sulphur Dioxide and its Use in the Pulp and Paper Industry. R. Leonard Hasche. Paper Trade J. 90, No. 26, 49-51 (June 26, 1930).—The water-absorption process for the production of liquid sulphur dioxide from waste gases (from roaster, pyrites burners or converters) cannot compete with the production of liquid sulphur dioxide by burning sulphur, because it is impracticable to operate economically on a gas low in sulphur dioxide (7 per cent or less). A very efficient pressure-refrigeration process has been devised, which includes the following features: cleaning the gas by electrical precipitation followed by special filters; passing to a gas storage to iron out fluctuations in the strength and production of gas, compressing to about 20 atmospheres, removing the heat of compression, drying by a special treatment (not disclosed), and cooling to about —100°F. by expansion of the gas with production of external work which is converted into electric power. The merits of liquid sulphur dioxide in the sulphite pulp industry are briefly discussed. With a 100 per gas, solutions containing the following amounts of free sulphur dioxide can be obtained: at 15°C. (59°F.) 12.5 per cent, at 20°C. (68°F.) 10.3 per cent, at 25°C. (77°F.) 8.9 percent.—A.P.-C.

Natural Sulphite Pulping Process. II. Effect of Yield, Chemical Properties, and Color of Pulps Produced by Changing the Ratio of Sodium Sulphite to Sodium Bicarbonate in the Cooking Liquor. Mark W. Bray and Paul R. Eastwood. Paper Trade J. 90, No. 25, 57-60 (June 19, 1930); Technical Association Papers Series 13, No. 1, 225-228 (May 1930).—The action of sodium sulphite and of mixtures of sodium sulphite and sodium bicarbonate on black gum (Nyssa sylvatica) was studied. It was found that the relative proportion of these two chemicals affects the velocity of the pulping process, the color, the chemical properties of the resulting pulps, and the amount of corrosion of the steel digester in which the reactions were conducted. The results indicated that, from the standpoints both of corrosion of the pulping apparatus and of color of pulps, ratios of sodium sulphite to sodium bicarbonate of approximately 3 to 1 give the most satisfactory results.—A.P.-C.

Sulphite Pulp from Hardwoods. H. Robert Heuer. Paper Mill 53, No. 25, 2, 4 (June 21, 1930).—Using a poor grade of maple, birch and beech, good pulp was obtained with a cooking acid containing about 7 per cent total and 6 per cent free sulphur dioxide, cooking for a total of 14 to 15 hours, bringing to a maximum pressure of 60 lbs. in 5 hours, and reducing to about 35 lbs. during the last 2 hours. The time of cooking could probably be considerably reduced. The unbleached pulp is of a kraft color and badly specked with a sawdust-like material. It whitens very quickly to a good unbleached spruce sulphite color, with a small amount of bleach, and could probably be used in this semi-bleached state in papers not requiring great strength. Bleaching in two stages (using about 50 per cent of the total bleach consumption in each stage) in Wolf high-density bleachers produced a very clean, white pulp of good strength, in a yield of about 980 lbs. per cord of wood. The strength and yield would probably be improved if the wood were in sound condition.—A.P.-C.

Circulating System for Sulphite Digesters. F. L. Mitchell, Paper Trade J. 91, No. 8, 57-63 (Aug. 21, 1930).—Thermometers were installed at the top portion of the digester where the dome begins, and at the bottom of the digester just above the bottom cone strap, and the two temperatures were recorded on the same chart. The combined record revealed the condition in the digester as regards heat distribution, or circulation, for which the usual single thermometer near the top could not be relied upon. When the top thermometer recorded an apparently normal cook (if considered alone), while the bottom thermometer showed rapid and irregular rise in temperature at the early period (2nd or 3rd hour) usually followed by considerable variation throughout the cook, the pulp produced was invariably poor with a considerable quantity of uncooked wood; when cooks showed this tendency to rapid rise of bottom temperature at the beginning; it could be checked by "shutting in" the digester and after a reasonable period starting steaming all over again, resulting in a normal temperature trend and good pulp. In order to obtain proper circulation and uniform heat distribution, liquor was withdrawn from the top and reintroduced at the bottom of the digester. Use of an injector was found unsuitable for the purpose. A pump handling the liquor at the rate of twice the liquor content of the digester per hour gave satisfactory results. Use of bronze pump and piping in time gave rise to copper sulphide scale which dirtied the pulp. Bronze lined with lead by the "Tubond" process has given promising results, but has not yet been in operation long enough to draw conclusions. This circulation equalizes the temperatures at the top and bottom of the digester; in the case of small (15-ton or less) digesters this equalization can be held almost throughout the cook, while with large (30-ton) digesters it becomes difficult to control temperature at the end owing to the reduction in the volume of liquid pumped when the chips begin to soften. As most of the steam required for cooking has been added, the importance of heat distribution is not so great at this stage. With 30-ton digesters strong pulp can be cooked without mechanical agitation, but it has a very high bleach consumption, to reduce which cooking time becomes too long to be economical. Application of circulation to these digesters has led to the following conclusions; based on average results of mill operation: (1) The strength of the pulp is improved by 10 per cent and the fiber is more uniform. (2) The cooking time can be shortened 1.5 hours with the same maximum temperature without lowering the quality. (3) If the maximum temperature is the same, there is a small steam saving; lower maximum temperatures give correspondingly lower steam consumption for the same cooking time. (4) Total bleach consumption is reduced by 20 per cent to 25 per cent, still maintaining the improved strength. (5) No quantitative measures are at present available as to the differences in yields or screenings, but the pulp from circulated digesters is known to knot and screen more easily. (6) Due to being able to blow with lower sulphur dioxide test of the liquor and still maintain the strength of the pulp, a reduction in sulphur consumption by reason of improved recovery is possible. (7) Cooking can be conducted with lower initial acid strength and lower combined sulphur dioxide, with consequent possible reduction in acid cost. A number of

temperature charts, taken from actual mill operations, are given to show the difference between ordinary and circulated cooks.—A.P.-C.

Semi-Sulphite Process. II. Experiments in Duplicating Commercial News and Wrapping Papers. C. E. Curran, W. H. Monsson and G. H. Chidester. Paper Trade J. 90, No. 14, 65-68 (April 3, 1930).—The semi-sulphite process consists essentially of the following steps: (1) charging the digester as usual, (2) through penetration below or at 110 deg. C. with the usual sulphite pulping chemicals, (3) a mild cook produced either by lowering the concentration of chemicals, lowering the ratio of chemical to wood, lowering the temperature, pulping for a shorter time, or any combination of these (4) discharging and thorough washing, (5) rod milling the softened chips into individual fibers. The pulp is then ready for the usual beating, milling and paper-making operations. A series of experiments were made using both coniferous and hardwood for the production of semi-sulphite pulps suitable for several grades of papers, such as news print, wrapper and manila envelope. The papers were made from pulp furnishes in which semi-sulphite replaced the normal amount of sulphite pulp usually used. The yields obtained varied from 58.8 per cent to as high as 75.5 per cent. The strength data on the duplicated papers, with one or two exceptions, were equal to the average of tests obtained on similar commercial grades. The color of the duplicated papers, with but two exceptions, was as good as that of the commercial grades. The estimated cost figures on the production of semi-sulphite pulp as compared with sulphite pulp show an advantage in favor of semi-sulphite pulp.—A.P.-C.

Process for Making Resinous Woods Suitable for Pulping by the Sulphite Process. Karl G. Bergstrom and Arthur F. Zennstroem. Fr. pat. 673,318, July 27, 1928.—The wood is chipped and extracted with spirit of turpentine, either alone or with dilute (e. g., 2 per cent) caustic soda solution. The alkaline treatment may follow the turpentine extraction. The solvent remaining in the wood after extraction is removed by steaming. The deresinified wood is not discolored, and gives sulphite pulp of as good quality as non-resinous woods.—A.P.-C.

Investigation of a Digester Explosion at Berlin, N. H. W. B. Van Arsdel and P. L. Irwin. Pulp Paper Mag. Can. 30, 471-473 (Oct. 23, 1930); Paper Trade J. 91, No. 18 169-171 (Oct. 30, 1930).—Though the results obtained so far in the investigation of the causes of the explosion of digester No. 16 at the Burgess Mill of the Brown Co., at Berlin, N. H., on August 12, 1930, do not permit of determining the immediate cause until further information is available from the metallurgical tests still under way, sufficient evidence has already been collected to prove that some of the steel used in building this type of digester was faulty. It probably was embrittled in service, though this has not yet been definitely proved. Moreover, the single butt-strap construction used is now recognized to be poor design.—A.P.-C.

Modern Digester Practice. Gus Enderlein. Paper Mill 53, No. 43, 14-17 (Oct. 25, 1930).—A brief review of the evolution of digesters used for sulphite, soda and sulphate cooking.—A.P.-C.

Special Papers and Processes

Method of and Apparatus for Producing Transparent Waxed Paper. John Decker, Arthur B. Green and Vasco E. Nunes, assignors to Nashua Gummed and Coated Paper Co., U. S. pat. 1,757,620, (May 6, 1930).—Paper which has been coated or impregnated with wax, such as paraffin, is subjected to the direct action of heat at a temperature sufficiently high to change the crystal structure of the wax so as to increase the refractive index, i. e., to increase the optical continuity of the wax and paper fiber and so produce waxed paper which presents no mottled appearance. This is effected by passing the paper through molten wax in such a manner that both sides of the sheet will be coated, passing the coated paper over and close to gas burners so that it is heated just short of causing combustion, and finally slowly cooling the paper.—A.P.-C.

Apparatus for Manufacturing Carbon Paper. Harold W. A. Dixon assignor to Columbia Ribbon and Carbon Mfg. Co., Inc. U. S. pat. 1,760,045, (May 27, 1930).—The purpose of the invention is to use the full width of the base stock and to prevent slightly thicker coating near the edges, as usually occurs. The coating is not applied to the full width of the paper, but an uncoated strip is left at each side. After passing the equalizer, the coated paper passes around a large roll, and, while it is in contact with this roll, a small wiper roll acts along each edge of the coated portion to spread out the excess coating at this point over the uncoated strip along each edge of the sheet.—A.P.-C.

Festooning Apparatus. Leland S. Rosener assignor to The Paraffine Co., Inc. U. S. pat. 1,762,243, (June 10, 1930).—The apparatus is intended for the handling of long webs of felts, such as floor covering, which is coated on both sides. It is designed so that after having been coated on one side, the material is hung in festoons and passed through a drying chamber of such dimensions that the coating is dry when it comes out at the other end. The outlet of the drying chamber is close to the feed end of the coating mechanism; and the unlooping mechanism is designed so that the material can be reversed and passed directly through the coating mechanism to coat the other side without having to rewind the material between the two coating operations.—A.P.-C.

Adhesive Paper. R. G. Drew assignor to Minnesota Mining and Mfg. Co. Eng. Pat. 312,610, (May 28, 1928).—Paper is provided with a coating which causes it to adhere to other surfaces by mere use of pressure; the adhesive may comprise plasticized plantation rubber, courmarone gum or resin or other polymerization product of coal tar derivatives, pigments such as zinc oxide, or various other ingredients.—A.P.-C.

Transfer Sheets for Ornamenting Surfaces. S. E. Wade Transfer Co. Proprietary, Ltd. Eng. pat. 312,004, (August 21, 1928).—A sheet of thin paper may be coated or impregnated with wax; the ink used includes a material such as castor oil, glycerol or lard which prevents it from drying on or penetrating into the transfer sheet. The ink may be formed of carbon black, castor or mineral oil, together with sulphate of quinine if the transfer is to be used in a photographic process.—A.P.-C.

Marking Carbon Paper. William Mendel. U. S. pat. 1,769,592, (July 1, 1930).—For applying marks such as trade marks to a transfer web, a cellulose nitrate solvent such as ethylene glycol monoethyl ether and carbon tetrachloride is applied which has a higher boiling point and low volatility and which is capable of increasing the capacity of the web for absorption of waxy, oily, transfer material and such transfer material is then applied to the web.—A.P.-C.

Stencil Sheets. S. Horii. Eng pat. 310,126, (Feb. 20, 1928).—Backing sheets for duplicating-machine stencil sheets are coated with a composition comprising a non-drying oil such as castor oli, with or without a hardening material, such as a wax or ester gum, and a solvent such as turpentine.—A.P.-C.

Stencil Sheets. S. Horii, Eng. pat. 310,181 (April 17, 1928).—A stencil sheet for use on duplicating machines comprises a sheet of fibrous material such as Yoshino paper coated with a composition containing esters of polysaccharides such as starch acetate, mannan acetate, collulose acetate or cellulose nitrate, dissolved in volatile solvents, together with fatty acid esters of gycole such as the oleic or ricinoleic acid ester of methylene, ethylene or propylene glycol, with or without tempering agents such as oils, fats, fatty acids and waxes.—A.P.-C.

Stencil Sheet. S. Horii, U. S. pat. 1,770,697, (July 15,1930).—A base of fibrous material such as Japanese Yoshino paper is

coated or impregnated with a composition including esters of polysaccharides such as starch ecetate, mannan acetate, cellulose acetate or cellulose nitrate and a liquid wax.—A.P.-C.

Coated Stencil Sheets. Alex B. Davis assignor to A. B. Dick Co. U. S. pat. 1,771,165, (July 22, 1930).—Type impressible sheets are formed with a coating containing a benzyl, parachlorobenzyl or phenyl ethyl ether of cellulose.—A.P.-C.

Adhesive Paper. G. H. Wilkinson and J. Muir. Eng. pat. 308,444, (March 2, 1928.)—John Muir. U. S. pat. 1,766,302, (June 24, 1930).—Paper is coated with an adhesive formed from: glue 25 to 40 parts, water 60 to 70 parts and 30 to 50 parts of mineral substances such as clay, chalk, terra alba, French white or plumbago.—A.P.-C.

Gummed Paper. I. G. Farbenindustrie Aktiengesellschaft. Fr. pat. 661,039, (Sept. 25, 1928).—Gummed rolls of paper have applied to the non-gummed side a layer of cellulose ester, mixed ester, or ester-ether of higher fatty acids to prevent sticking.—A.P.-C.

Stencil Sheet. Alex B. Davis assignor to A. B. Dick & Co. U. S. pat. 1,763,955, (June 17, 1930).—A base material is coated with a type-impressible cellulose compound coating such as a nitrocellulose composition containing the uniform esterfication product of acetic and propionic acids with a polyhydric alcohol such as glycerol, *e.g.*, propionyl diacetin.—A.P.-C.

Coating Paper With Metal. L. W. Cutler, C. A. Klein and Associated Lead Mfrs., Ltd. Eng. pat. 326,792, (Dec. 14, 1928).—In coating paper with lead or other metals, an adhesive is applied, reduced to a slightly tenacious conditions and powdered metal is rubbed on the surface; the coated material is subjected to pressure to flatten out the metal particles and produces a continuous film of coating metal.—A.P.-C.

Metal-Coated Paper. Albert L. Clapp. U. S. pat. 1,765,862, (June 24, 1930).—Paper is formed comprising a material such as lime with asbestos and cellulose which is capable of reacting to produce a hardening compound with a reagent such as sodium silicate and is then treated with such reagent. Electrically conducting material such as graphite is applied to the surface of the paper. It is formed into desired shape such as plates or other dishes at an elevated temperature, and copper or silver or other metal is then electro deposited on the article.—A.P.-C.

Process and Apparatus for Coating and Marbling Paper. G. M. Brown. Eng. pat. 332,190.—The process consists in passing the sheet past a fixed station over a trough containig a liquid medium on which a film of pigment, varnish or lacquer is floated, in such a manner that successive portions in the length of the paper come into contact with the liquid and remove the film by movement thereof in relation to the flotation medium in a direction along its surface. The film has sufficient tensile strength to permit it to be drawn along the surface of the liquid without disruption and consists of pigments in vehicles such as boiled linseed oil or solutions of ester or ethers, with or without thinning agents and volatile solvents. Varnishes, lacquers, waterproofing solutions or dyes may also be used. The process is particularly applicable to the marbling of paper, in which case supplies of differently colored paints are deposited on the liquid and agitated to form a marbled film. Portions of the sheet to be coated may be treated with a resist so as to prevent the adhesion of the coating on those portions—A.P.-C.

Modern Drying Plants for Coated Paper. Anon. World's Paper Trade Rev. 94,1260-1666,1338,1340 (Oct. 10, 1930).—An illustrated description of the Carrier-Ross coated paper drying installation at Clyde Paper Mills, Rutherglen.—A.P.-C.

Mfrs. of Mineral-Coated Paper. W. W. Triggs, from Champion Coated Paper Co. Eng. pat. 331,578, (April 5, 1929).—Paper having a top coating consisting of at least 70% of mineral filling (clay, satin white, etc.) and not more than 30% (on the dry basis) of adhesive (casein, glue, starch with a material is effected on the exposed area of the sheet, which small amount of soaps is finished by bringing the coated side, while the coating is in a plastic condition produced by wetting or heating, in contact with a solid non-adhering surface, etc., a revolving metal drum or a belt of hard rubber, having a finish similar to that required on the paper; the coating is then rendered non-plastic by drying or cooling, and the paper is removed from the solid surface.—A.P.-C.

Coating Paper. W. H. Pease, Eng. pats. 324,340 and 324,341. —*No. 324,340.*—Apparatus for coating paper with a drying solution or emulsion, comprises, in a single unitary structure, a feed roll of the material to be coated, at least one coating trough and coating roller, a cooling roller, a series of guide rollers, thermostatic means for controlling the temperature of the solution in the coating trough and of the cooling drum, thermosensitive means for stopping the operation of the machine in the event of non-permissible variation of temperature of the materials or of suitable parts of the machine (*e. g.*, the emulsion troughs, cooling rollers or other pertinent parts of the machine), and a common drive operating simultaneously the feed roll, coating rollers, guide rollers and cooling rollers. The emulsion troughs, each of which is followed by a cooling drum, may be heated by electric heaters either directly or through an oil or water bath. *No. 324,341.*—Apparatus for applying a thin layer of material to paper comprises as a unitary structure on a common frame, an unwinding device for the coating stock, a two-roll coating device, a roller type washing device incorporating a metal roll and a vulcanite counterroll, an air chamber with driven guide rolls for supporting the coated web and with devices for conditioning the air therein, and a reeling device for the coated paper, all the rolls with which the material comes in contact being driven from a common source at the same peripheral speed. Thermostatic means for controlling the temperature of the various parts are controlled, and also thermally operated means for cutting off the source of power on the occurrence of a non-permissible temperature in parts of the apparatus.—A.P.-C.

Stock for Coated Paper. Leon Bergada Ginora. Chime et Industrie Special No., 458-61 (March, 1930).—Practical operating hints on the selection of raw materials, beating and paper machine operation required to produce a satisfactory coating stock.—A.P.-C.

Mfg. of Carbon Paper. J. Oddon. Paper Trade J. 91, No. 13, 53-54 (Sept. 25, 1930).—Practical directions regarding the mfg. of the base paper and of its coating with the coloring emulsion. —A.P.-C.

Impregnated Paper for the Mfg. of Rifle Cartridge. E. J. Johnson. Eng. pat. 233, 241, (June 28, 1928).—The paper is impregnated with paraffin and covered with a coating of pyroxylin.—A.P.-C.

Process for the Mfg. of Stencil Sheets. A. de Waele. Eng. pat. 317,805, Feb. 23, 1928).—Water-insoluble and non-hygroscopic compounds, together with a water-soluble soap, are added to organic gelatinizing colloids which can be dispersed in aqueous medium.—A.P.-C.

Asphalt Board. D. P. Bailer. The Flintkote Co. Paper Mill 53, No. 23, 10, 24,26, (June 7, 1930).—A description of the K-B process for incorporating asphalt, in an emulsified form, into paper stock before it goes to the paper machine, or for applying asphalt to a web of paper between two of the cylinders of a multi-cylinder machine, or for pasting two plies of paper together to form a waterproof and moisture-proof sheet.—A.P.-C.

Coating Machine. Robert T. Johnston assignor to The Patent & Licensing Corp. U. S. pat. 1,764,080, (June 17, 1930).—The machine is designed primarily for applying ground slate or other suitable surfacing to sheet roofing material during its process of mfr. The impregnated and coated roofing is held in elevated position and the surface material thrown up against

its lower face. In this way a uniform deposit of the granular material is effected on the exposed area of the sheet, which may be defined by a stencil so as to produce a desired pattern. Suitable properly related stencils may be used for the successive application of granular material of various colors.—A.P.-C.

Fibrous Pulp Containing Asphalt. Earl P. Stevenson and Harry A. Buron assignors to The Richardson Co. U. S. pat. 1,771,150, (July 22, 1930).—In preparing a material suitable for making sheets, etc., molten asphalt is mixed with wet pulp to effect dispersion and then further mixed with sufficient water partially to break up the adhesive mass of fiber and asphalt.—A.P.-C.

Material for Roofing. Albert C. Fischer assignor to Philip Carey Mfr. Co. U. S. pats. 1,769,632 to 1,769,634, (July 1, 1930).—*No. 1,769,632*—A vehicle such as roofing felt is saturated with a road oil of bituminous nature and coated with a normally viscous bituminous adhesive so that it is separable from contact with another sheet along the lines of th eviscous coating. *No. 1,769,633*—A vehicle such as sheet roofing is saturated with a bituminous composition and coated with a drying waterproof layer and over this there is applied a slow drying lastingly adhesive material which is normally tacky to the touch, such as "tree tangle foot" or a similar mixture. *No. 1,769,634* relates to a process involving saturating a vehicle such as a roofing paper with waterproofing material such as an oil composition and then coating the material with a composition prepared by melting a bituminous substance which has a melting-point above 50°C., allowing the material to cool somewhat and mixing it with a waterproof adhesive or gummy material.—A.P.-C.

Laminated Composition Board. Lester Kirschbraun assignor to The Flintkote Co. U. S. pat. 1,765,839, (June 24, 1930).—Several layers of roofing felt saturated with sodium silicate are adhesively united and a facing layer of water-resistant paper is applied to the face of the sheet.—A.P.-C.

Waterproof Paper Dozier Finley assignor to The Paraffine Companies, Inc., U. S. pat. 1,747,232 (Feb. 18, 1930).—In making waterproof paper, a lime-alum-asphalt emulsion is incorporated into the pulped stock previous to running it on the paper machine.—A.P.-C.

Mercerized Wood-Fiber Tissue. Milton O. Schur and Royal H. Rasch assignors to Brown Company. U. S. pat. 1,749,003 (March 4, 1930).—A wood fiber web such as a high alpha-cellulose web is treated with caustic soda solution of mercerizing strength containing an oxidizing agent such as chlorine, and the web is washed substantially free from treating chemicals and is then converted into a cellulose derivative such as nitrocellulose. The preliminary mercerization treatment serves to effect purification and bleaching.—A.P.-C.

Paper Making from Stock Intermixed with Precipitated Celculoid. Ernest Lionne. U. S. pat. 1,752,802 (April 1, 1930).—Paper is made from stock with an admixture of precipitated celluloid.—A.P.-C.

Impregnating Paper for Insulation of Electric Cables and Apparatus Therefor. Charles James Beaver, assignor to W. T. Glover & Co., Ltd. U. S. pat. 1,752,972 (April 1, 1930).—A long strip of paper is impregnated with electrically insulating material by passing through a tank containing the impregnating liquid and kept under a vacuum. A supplemental tank is mounted over the main tank with which it communicates through a slot. The impregnating liquid is pumped from the main tank to the supplemental tank and overflows through an adjustable valve back into the main tank. The paper passes out of the main tank through the slot into the supplemental tank.—A.P.-C.

Apparatus for the Manufacture of Ornamental Paper. Ernst Mahler and Charles G. Bright assignors to Paper Patents Company. U. S. pat. 1,767,252 (June 24, 1930).—A secondary flow box is provided to deliver a layer of stock on the moist sheet from the main flow box before the base sheet reaches the suction boxes. Means are provided for depositing drops of liquid color on the base sheet between the two flow boxes and for spraying liquid color on the composite sheet, preferably at or near the suction boxes.—A.P.-C.

Waterproof Paper. George A. Brown assignor to Bennett, Inc. U. S. pat. 1,753,690, (April 8, 1930).—A paper furnish comprising waste waxed paper is disintegrated, the wax constituent is dispersed, the dispersed material is fixed by a coagulum such as may be formed from sodium silicate and alum, and the material is run off on a paper machine. Rosin is also added.—A.P.-C.

Process for the Mfg. of Moistureproof Paper. Adelbert M. Hinkson, U. S. pat. 1,769,513 (July 1, 1930).—Wax paper is mixed with asphalt waste in approximately equal amounts and beaten in a beater with hot water. It is then run off on a cylinder machine, both sides of the sheet being colored, and it is made into small sheeting rolls.—A.P.-C.

Wallboard Package. George E. Griffith assignor to Certain-Teed Products Corporation. U. S. pat. 1,770,516 (July 15, 1930).—A number of sheets are superposed to give an aggregate thickness sufficient to resist transverse buckling. Relatively rigid metal edge bindings are placed to embrace each edge of the package and are held in place by suitable binding means, such as wire, around the package.—A.P.-C.

Two-Ply Sheet Material of Cloth and Rubber-Saturated Paper Layers. Kirke L. Moses. U. S. pat. 1,758,053 (May 13, 1930.)—The layers are joined by an adhesive containing rubber, and the two-layer product is suitable for automobile tops, etc.—A.P.-C.

"Marbleizing" Paper. George M. McGuire. U. S. pat. 1,761,-305 (June 3, 1930).—The paper is immersed in a bath containing water and alcohol having on its surface a composition containing white lead, a vegetable oil such as linseed oil, benzene and a coloring substance.—A.P.-C.

Glossing Paper. I. G. Farbenindustrie Aktiengesellschaft. Fr. pat. 673,900 (April 23, 1929).—Paper, particularly for use in photography, is glossed by coating it with molten hydrocarbons, resins or waxes, or mixtures of these, passing it over a support heated above the melting point of the applied layer, and removing the excess with flexible scraper. The paper may first be treated with a substance impermeable to the glossing agents.—A.P.-C.

Paper Fabrics, M. J. Shoemaker assignor to C. F. Burgess Laboratories, Inc. Eng. pat. 317,330 (Aug. 13, 1928).—Absorbent fabrics suitable for wash cloths, towels, or napkins, formed of wood pulp and withstanding washing without disintegration, are prepared by use of a discontinuous coating of a cellulose ester or ether which is subsequently regenerated so that the fibres are held together by the regenerated cellulose.—A.P.-C.

Water-Resistant Paper. George J. Manson. U. S. pats. 1,762,928 to 1,762,931 (June 10, 1930).—**No. 1,762,928**—Paper is made from pulp containing "non-fouling" wax composition, such as a paraffin mixture, so that the paper is substantially free from wax spots. **No. 1,762,929** specifies adding to the paper pulp a wax dispersion which is at least partially pre-set, such as a mixture including paraffin, rosin and glue. **No. 1,762,930** specifies incorporating rosin and an encysted waterproofing agent such as a paraffin mixture with wet paper pulp and sheeting the pulp on a filter-web without clogging the web with the waterproofing agent. **No. 1,762,931** describes a rosin-sized water-resistant paper, stable toward grease, containing pre-set paraffin wax.—A.P.-C.

Document Paper. Theodore J. Snyder assignor to Snyder Document Protection Co. U. S. re-issue pat. 17,708, June 24, 1930 (original pat. 1,727,912, Sept. 10, 1929).—In writing with ink on a bibulous paper treated with casein, the writing is so diffused into the paper as to preclude erasure or alteration without permanent disfiguring of the paper.—A.P.-C.

Section of the

COST DEPARTMENT

of the

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Edited by T. J. Burke C. A. Director Cost Dept.

Scientific Management in a Statistical Department*

By Leonard Kuvin[1]

The application of principles of scientific management in work performed by so-called brain workers encounters difficulties not originally met in other fields of endeavor. This holds true of workers in the field of statistics.

Such difficulties spring from two sources. One is that accomplishments through mental activity are complex and the other is that results of mental activity are produced by an organism, the primary control of which resides within the organism. It is because of these conditions that brain workers most often resent guidance and control as they would so much personal intrusion.

From an economic standpoint, however, it is extremely important that attention be given this problem. Inefficiency in thought and in the performance of work is very costly and warrants, in an economic sense, that measures be taken to eliminate wasted effort.

The problem can be viewed in the light of three elements. One is the care with which the introduction of sufficient methods must be taken. This aspect of the problem concerns itself with the psychological possessions of the personnel employed. Another element is the analysis of work to be done by a staff of workers, and its functional sub-divisions into tasks together with a workable organization and the adoption of some technique of managerial control. The first and second elements are perhaps the most important and as such are worthy of detailed and careful treatment. This paper, however, is designed to prevent the third element in the problem.

Our study of a statistical department then divides itself into two parts. The first concerns itself with organization; the second, with managerial control.

Organization

The steps in organizing a statistical department are briefly (a) selecting proper personnel, and (b) obtaining adequate equipment.

The personnel of the statistical department depends mainly upon the variety and type of work to be done. These may be: (1) Practical Research (2) Routine Computing (3) Graphic Presentation (4) Theoretical Research.

These types of work exist seldom in classes by themselves and are generally associated with one another to a larger or smaller degree. Data finding, compiling, and computing are characteristics of all forms of work.

Statistical workers may be roughly classified as: (1) Compilers; (2) Computers; (3) Draftsmen; (4) Analysts; (5) Statisticians.

A compiler is a clerk who obtains and posts information from original and secondary sources. The essential qualities of a compiler are neatness, good penmanship, accuracy, typing ability, and general intelligence.

A computer is primarily an arithmetician who can operate various calculating machines, operate a slide rule, and use tables of logarithms. The essential qualities of a computer are accuracy, persistency in tracing and locating errors, neatness and general intelligence.

A statistical draftsman is a worker who can compile information, compute and present results in graphic form so that they will be intelligible to individuals not acquainted with statistical methods. Such a worker must be a compiler and computer. Furthermore, he (or she) must be familiar with all forms of graphic presentation, the practical technique for quickly drawing charts; he must know the mechanics of photo-engraving and reproduction and must also have something of an artistic sense.

An analyst is a statistical worker who is capable of sub-dividing a problem into its parts and deciding on the steps to be taken in solution. This type of worker is generally familiar with the work of other statisticians and statistical organizations, besides knowing where information is available he is capable of utilizing it in the solution of a problem. Such a worker must combine clear thoughtedness with the qualifications of compilers and computers. In addition he must possess an understanding of statistical methods.

A statistician is an individual who by virtue and experience is accomplished in all phases of statistical work. He is capable of collecting and compiling data, of making the necessary computations for the attainment of desired results, of analyzing a problem and determining its solution, of graphically presenting facts and furthermore of interpreting them. The statistician combines practical abilities with a knowledge of statistical methods. He (or she) may be in charge of a specific department or in charge of several of them.

The department heads in a statistical organization must have all the qualities and abilities of the workers in that department to a very high degree, and must also be able to get work done. In other words, the department head of a computing or drafting department must have the qualities of computers or draftsmen, and must have also some degree of managerial ability.

Though the duties of a statistician very often are those of the analyst and delegator of assignments to others, he can serve equally well on any of the jobs of subordinates in the statistical organization. Several statisticians in an organization constitute a staff whose energies directed to different problems, are coordinated by the chief statistician.

Equipment.—The amount and kind of equipment in a historical organization depends upon the nature of the work. Computing machines, computing charts and forms especially designed for

* From "The Management Review"

[1] Chief Statistician Index Number Institute.

work that has to be done, slide rules, log tables and nomographs constitute in a general way the computing equipment required. Considerable savings of time are effected by simple auxiliaries such as, tables, slide rules and nomographs. These devices are designed for specific types of work and too much attention cannot be paid to obtain them and provide for their use.

Machines may be selected for all-round working service or for specific types of work where the amount of work requires the particular type of machine throughout the day and every day. The best type of machine is one which is specifically intended for the work it does. Where the work is not steady, machines might be selected which will serve several purposes. An important point to be noted is that machines ought to be kept running most of the time. They are expensive, and their idleness reveals something wrong in department management.

Management

The management of a Statistical Department presents many problems. Responsibility for managerial efficiency rests ultimately with the chief statistician. There are many devices which the manager of a Statistical Department may employ to assist him in the execution of his work. Though these aids will take on the color of the particular organization they are intended to serve, they have sufficient basic resemblance to warrant the description of particular examples. For important types of charts embodying graphic managerial control (1) the Assignment Chart; (2) the Layout Chart; (3) the Individual Time Record Chart and (4) the Duty Schedule. These developed in one form or another and adapted to the needs of the particular organization provide the backbone for a major portion of management control.

Assignment Chart

This chart is an instrument which presents in a clear and simple form the entire problem or major parts of it sub-divided into elements. It is the chart which embraces in workable fashion the findings of the analyst. By its aid the work to be performed is assigned and observed in all stages of completion. This type of chart may be drawn up on the typewriter to suit the individual case, and may be printed whenever the work of the department employing it is sufficiently repetitive in nature to require the use of a standard form. In its essentials it is designed for the particular problem of weekly routine work. The description of the operations must necessarily be brief and only long enough to indicate what is meant. The operation numbers are intended to refer to the real description which may appear on the reverse side of the layout chart. This chart may be filled out, as the work progresses, by signatures of initials in the various boxes, by crosses, or by bars running through the lower halves of spaces in the fashion of bars on Gantt Charts. The latter method is often most satisfactory because besides being neat it better conveys the idea of completion of operation than do either signatures or crosses. Initials may be inserted in the boxes to indicate which individuals are to perform certain tasks. When each task is completed the box is filled with a black bar or cross in the usual way. This chart may be drawn up on ordinary letter size paper and be almost entirely constructed by typewriter.

There is one fact about the Assignment Chart which is significant. It is that there is no reference to the time of beginning or completion of the task of operation. For this reason it is a static chart and while it acts only as a record of what has been done and what is being done serves to introduce graphic control.

Layout Chart

The particular instrument designed to serve as a time control is the Layout Chart. On this chart an entire problem or part of it is laid out in a manner similar to that on the assignment chart. Running across one dimension, however, preferably from left to right, is the time axis.

In the Layout Chart (which is a Gantt Chart) the descriptions of operations must of necessity be brief and only long enough to indicate them. In addition to the operation numbers, which act as references to the reverse side of the card or chart for fuller descriptions of the operations, there is a column for initials. This column is used to point out which individuals execute specific tasks.

This suggests that this form of Chart is of an entirely different type. It is dynamic rather than static. It points out what is to be done, by whom, and when. The time axis running from left to right points out when the individual tasks are scheduled to be done and when they have actually been done. The statistician presents the clerk whose duty it is to keep this chart with the schedule of performance.

For example, the work on Friday indicates that Operation 1a which applies to the oils group is to be done at 9.30; 1b is to be begun at 9:30 and completed at 10:00; 1c is to be begun at 10:00 and completed at 10:30; 1d is to be begun at 10:30 and completed at 11:00. 1e is to be begun at 11:00 and to be completed at 11:30; and so on with the others.

The actual mechanics of scheduling is worked out by time analyses of past work as will be described below. The charts are kept by a clerical assistant. Little angles are placed on the chart between the beginning and ending times and a thin line drawn to connect the upper sides of angles. These constitute the graphic time schedule.

We have then in this simple chart a record of what was expected and what was accomplished. This record after having served its purpose can be used for future reference as to performance or the amount of time required for operations on that particular date.

Layout charts while used very extensively in factories have as yet found comparatively little use in general offices let alone statistical offices. They are extremely valuable and lend themselves to complicated work over a period of many days or weeks. It is a time saver and an extremely valuable assistant to the individual who plans work and follows it through to completion. It quickly provides the chief executive with information as to when problems may be expected to be completed. Though oft-times the schedule is incorrect the use of such scheduling charts introduces some control where none previously existed.

Time Record Chart

There is one more chart which merits description as it is a necessary adjunct to the graphic managerial control as described in the two charts above. This is the individual's Time Record Chart. It consists of a simple grid upon which the statistical worker records by bar plotting an operation number, the time when each operation is begun and the time when it is completed. They, too, can be typed on ordinary paper, and when sufficiently applicable to many types of work can be printed in some standard form. These records are used for keeping the layout chart up to date and also for furnishing management with some idea as to the length of time of each operation. The times recorded are essential for future scheduling of similar tasks.

Further use of these individual time records can be made for calculating and distributing the costs of certain types of work and bringing the statistical organization easily and effectively onto a cost accounting basis. When enough of these time records are obtained, similar operations can be segregated and studied and unit costs determined. Future work can be estimated as to time and expense from these observations.

Time record charts fit very effectively into the graphic method of managerial control above described and complete the system. These individual time records in graphic form eliminate almost entirely the objections most office workers have to time record by time clocks. This is so because graphic presentation introduces the artistic rather than the mechanical suggestion of time recording.

In fact, all the three forms blend into a smooth working system. They do so without incurring the displeasure or resentment of personnel. To be sure, this form of graphic control does not have for its objective the driving of productive output. Among statistical workers such an aim would be a mistake, for if there is no freedom of spirit, the likelihood of errors is greatly increased.

On the contrary, the system aims to assist all in the achievement

of an identical end; the orderly and systematic accomplishment of the work in hand. Only when work is sufficiently routine and repetitive, may economies be sought. In repetitive operations the best ways of performance may be found if the statistician in charge and the workers who are trusted with the execution of tasks cooperate in introducing innovations and short cuts and otherwise eliminate wasted effort. Tasks may then be assigned and bonuses paid for accomplishment within standard time periods. Furthermore, all these supposedly unattainable ends can be brought about without much effort and with little friction only when the proper amount of tact is employed in the process.

Duty Schedule

Intimately related to the question of friction, is one very important instrument which remains to be described. They may be called the duty schedule. Each department in a statistical organization ought to have one. In its simplest form it is a schedule laid out in three columns. The first column briefly describes the duties of the several individuals in a department; the second column defines the authority allowed or means permitted to fulfill these duties; the third column gives the names of the individuals. Through the instrumentality of this schedule, authority is granted with each item of responsibility. Furthermore, when these working schedules are hung on a wall or bulletin board, the tasks and responsibilities of each individual are known to all members of the department. In this way each individual is granted a field for the exercise of ingenuity, and is glad to have the opportunity to exercise his creative facilities whenever and wherever possible. Also, each worker is made to feel that a full measure of credit will be granted him whatever ideas are offered in his work.

Conclusion

In conclusion, we must point out, that no scheme of organization, no staff of workers, and no collection of equipment is capable of producing good results if the spirit is lacking to properly cement all into a coherent effective whole. This spirit may be attained by introducing the urge to work. Such an urge may be stimulated through incentives, both financial and non-financial, the discussion of which is beyond the scope of this paper. Among creative workers, the problem is a difficult one and ever taxes the ingenuity of the executive in charge. Perhaps a chief statistician had better include among his qualifications those of the practical psychologist. In any event he has gone a long way towards achieving the introduction of scientific management in his branch of the organization if he successfully installs a workable system of graphic control.

News Print Production in February

Production of news print paper in Canada during February 1931 amounted to 164,552 tons and shipments to 162,350 tons. according to the News Print Service Bureau. Production in the United States was 88,788 tons and shipments 90,901 tons, making a total United States and Canadian news print production of 253,340 tons and shipments of 253,251 tons. During February, 23,073 tons of news print were made in Newfoundland and 1,318 tons in Mexico, so that the total North American production for the month amounted to 277,731 tons.

The Canadian mills produced 49,123 tons less in the first two months of 1931 than in the first two months of 1930, which was a decrease of 12 per cent. The output in the United States was 45,671 tons or 19 per cent less than for the first two months of 1930. Production in Newfoundland was 4,298 tons or 10 per cent more in the first two months of 1931 than in 1930 and in Mexico 811 tons less, making a continental decrease of 91,307 tons or 13 per cent.

During February the Canadian mills operated at 55.4 per cent of rated capacity, United States mills at 65.4 per cent and Newfoundland mills at 98.7 per cent. Stocks of news print paper at Canadian mills totalled 42,259 tons at the end of February and at United States mills 33,627 tons, making a combined total of 75,886 tons which was equivalent to 4.2 days' average production.

W. L. Campbell With Marcy Rod Mills

Wilburt L. Campbell, widely known in the New England paper industry, has just been added to the technical staff of the Paper Mill Division of the Mine and Smelter Supply Company of Denver, manufacturers of Marcy Open End Rod Mills which are rapidly being adapted for the beating and refining of paper pulp.

Born and educated at Berlin, N. H., Mr. Campbell began his career in the paper industry as screen boy in the Berlin plant of the Brown Company. Beginning at the bottom he passed through the position of beater helper, paper machine helper, backtender, and machine tender. After serving the Brown Company for eighteen years he resigned and became machine tender for the Deerfield Valley Paper Company at Monroe Bridge, Mass.

He was later appointed tour foreman of the Warren Manufacturing Company at Milford, N. J., and after three years in this position became day boss of the Nashua River Paper Company at East Pepperell, Mass., and after two years in this capacity he

WILBURT L. CAMPBELL

became mill superintendent of the St. Regis Paper Company at Oswego, N. Y. Having served this company for three years he resigned and has since engaged in paper research work for a number of prominent manufacturers, among whom were Nekoosa-Edwards Paper Company of Port Edwards, Wis., Blake & Higgins of Bellows Falls, Vt., and other manufacturers of high grade sulphate and sulphite paper.

The rapid development of the Marcy Rod Mill in the paper industry has necessitated the expansion of the Paper Mill Division of the Mine and Smelter Supply Company, according to O. H. Johnson, manager.

Mr. Campbell will maintain his headquarters at the company's paper laboratory in Denver where he will collaborate with O. H. Johnson and Sidney D. Wells, consulting engineers. His services will be available without obligation to paper manufacturers interested in adapting Marcy Rod Mills to their beating problems.

Champion Coated Improvements Described

The latest issue of the "Messenger," the house organ of the Black-Clawson Company, owners of Shartle Bros. Machine Company, contains a comprehensive description of recent improvements at the plant of the Champion Coated Paper Company, at Hamilton, Ohio. All of these improvements were calculated to reduce the cost of operation and to improve the quality of their product. The magazine is beautifully printed and illustrated and may be obtained by applying to the Black-Clawson Company, Hamilton, Ohio.

COST SECTION

New York Trade Jottings

E. C. Woodruff was recently elected vice-president and Eastern manager of the Bryant Paper Company, Inc., of Kalamazoo, Mich., with New York headquarters at 19 East 47th street.

* * *

Romm-Baigel Paper Corporation has been chartered under the laws of the State of New York with a capital stock of $10,000. H. Mates, of 291 Broadway, New York, was the attorney.

* * *

Utility Paper Box Company, Ltd., has been incorporated under the laws of New York State with a capital stock of $20,000. W. Lurie, of 291 Broadway, New York, was the attorney.

* * *

M. L. Jackson Company, of 203 Greenwich street, New York, has been appointed sole agent for Auto-Copy paper, which combines the results of carbon and copy paper in one sheet. It is made in five colors.

* * *

Alling & Cory Company, general paper merchants, of 313 West 37th street, New York, announce Alcor Superfolder, a new paper designed to meet the rigid requirements of a well planned broadside.

* * *

E. J. Keller, of the E. J. Keller Company, Inc., dealers in paper mill supplies, of 200 Fifth Avenue, New York, is attending the annual meeting of the Waste Material Dealers Association in Chicago this week.

* * *

W. L. Jones, Inc., paper and twine dealers, of 96-98 Prince street, New York, announce that in addition to their regular telephone number, Canal 6-6529, they have had to have another telephone installed to take care of their increased business, Canal 6-6527.

* * *

The regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry was held at George's Restaurant, New York, last Tuesday, when problems affecting the members were freely discussed. There was a good attendance.

* * *

Dr. Ralph H. McKee, of the Department of Chemical Engineering, Columbia University, New York, gave an address on "Paper Pulp From Hybrid Poplars, a Reforestation Remedy," at the Conference of Technical Experts, held at Washington, D. C., last Monday.

* * *

Walter F. Daley, formerly manager of distribution, Radio Corporation of America, and special contract representative of Engineering Products Division of the R. C. A. Victor Company, Inc., has joined Engineering Research Department of the Robert Gair Company, New York, where he will assist in an enlarged program of research in paper products.

* * *

W. H. Donaldson and Mrs. Donaldson are celebrating the thirtieth anniversary of their wedding at the Hotel Traymore, Atlantic City. Mr. Donaldson, who is acting manager of the pulp department of the Perkins-Goodwin Company, New York, and a director of the same, has been associated with the pulp and paper Industries for about 33 years.

* * *

The Galewitz Brothers, Jack and Leo, owners of the Great Atlantic Paper Company, Inc., of 77 Wooster street, New York, purchased during the recent Paper Convention more than $500,000 worth of book papers, offset, bonds and news print, and have already taken into stock over twenty car loads of this paper during the last ten days, while the balance is now *en route* from the mills.

* * *

Summerfield Ency, sales promotion manager of the New York office of the Champion Coated Paper Company, addressed the Second Conference of Technical Experts at Washington, D. C., last Monday, on "Paper and Ink Testing—Some Simple Tests and Their Application; Some Troubles and the Remedy." All meetings of the conference were held in the beautiful new Harding Hall, which was made available through the courtesy of George H. Carter, Public Printer of the United States.

* * *

Union Gummed Products Company, manufacturers of gummed sealing tape, has moved its general offices and plant to Bush Terminal Building No. 3, at 252 36th street, Brooklyn, N. Y. This move represents an expansion of fully 50 per cent in space, machinery and equipment since 1928. The progress of this corporation in the manufacture of gummed sealing tape is attributable to the utilization of the best mechanical and scientific methods available.

W. T. Hanson Building New Tacoma Mill

TACOMA, Wash., March 14, 1931.—W. T. Hanson, formerly manager of the Nu Hope Paper Company, Security, Md., who has had wide experience as an engineer in paper mill construction and operation, having revamped the Antietiam mill at Hagerstown, Md. and started it up on kraft specialties, but resigned to take up a similar position in the Pacific Northwest, is at present construction engineer of the Riverside Paper Company in this city. Work on this plant, which has been under construction for the past month, is temporarily held up owing to some difficulties among the stockholders.

One building, 30 by 280 feet, has been completed and is ready for the installation of machinery. The plant is to consist of two more buildings, which will be devoted to the manufacture of specialties and tissue papers. The equipment will consist of two paper machines. Sufficient orders are already on hand to keep the mill in operation for the first few months and judging from the prospects at present, the mill will be able to operate on orders continuously after that time.

It is said that the men who are back of this project are fully capable of taking care of all finances of whatever character and it is expected that the present troubles will be ironed out within a short time when the construction work will be resumed and completed as soon as possible.

The plant is situated along tide flats, south of the eastern approach of the new Pacific highway bridge over the Puyallup River. The plant is located just outside the city limits, between Tacoma and Seattle.

Injured Paper Mill Workers Get Compensation

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., March 16, 1931.—A number of injured paper mill workers in this section were granted awards at recent Compensation Court sessions conducted by Judge James Richardson. Among those receiving benefits were the following: James Dickenson, Ticonderoga Pulp and Paper Company, $299.16; Ray Crossman, Ticonderoga Pulp and Paper Company, $101.57; E. S. Chandler, Glens Falls Paper Company, $33.84; Arthur Blakely, Ticonderoga Pulp and Paper Company, $120.24; Frank Murphy, Harrisville Paper Company, $14.53; William Abraham, National Paper Products Company, $15.21; Jean Terillion, Adirondack Core and Plug Co., $13.85; George Thomas, Ticonderoga Pulp and Paper Company, $11.90.

Consider This New Eastwood Seam With Big Open Suction Area

WHAT would a strong light show if you put it under the seam used on all Eastwood "Perfection" Fourdrinier Wires?

This is what you'll find:—The Eastwood seam has very nearly the same suction area as the body of the wire. As you know, that makes for better operation when running on the Fourdrinier machine.

Compare the Eastwood seam shown above with the old fashioned seams. Its superiority as to open suction area and simplicity is at once apparent.

This seam is now standard on all our Fourdrinier wires, from those for 10 lb. tissue up to high speed newsprint.

EASTWOOD CORPORATION

Established 1877, Belleville, N. J.

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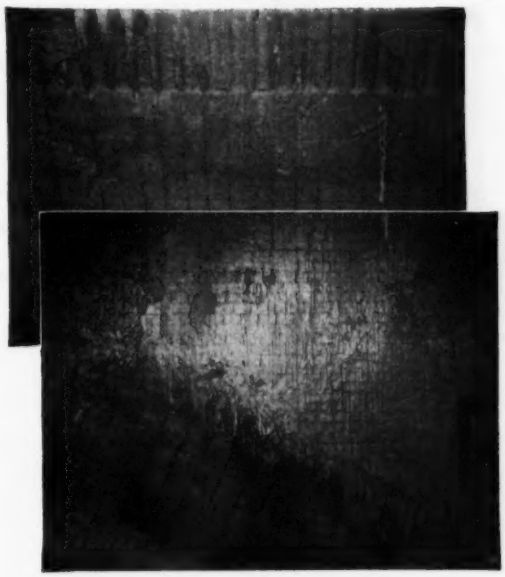
"Perfection" VALVES



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A-E-CO Water Walls increase the capacity of a furnace by making it possible to operate at higher ratings. They protect the furnace walls and reduce maintenance. At the same time, they increase the efficiency with which the coal is burned by producing better conditions in the stoker fuel bed.

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Cambridge Surface Pyrometer

is an instrument which applied to the surface of a dryer or calender roll, instantly indicates the exact surface temperature. Its use enables the operator to locate water logged rolls and to maintain every roll at the correct temperature for efficient progressive drying.

The instrument is compact, rugged and easy to read. The extension rod permits temperature checking across the entire roll. Scale ranges are 50-250° and 50-400°F.

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STEBBINS
Engineering & Manufacturing Company

WATERTOWN, New York SEATTLE, Washington

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING MARCH 14, 1931

SUMMARY

Cigarette paper .....1896 cs.
Wall paper .....8 bls., 54 cs
Paper hangings .....28 bls.
Painted paper .....16 cs.
News print .....2234 rolls
Printing paper .....16 cs.
Wrapping paper .....8 bls.
Decalcomania paper .....62 cs.
Filter paper .....4 bls., 79 cs.
Drawing paper .....13 crates, 10 cs.
Coated paper .....6 cs.
Basic paper .....51 rolls, 27 cs.
Baryta coated paper .....75 cs.
Metal coated paper .....60 cs.
Aluminum paper .....6 cs.
Surface coated paper .....6 cs.
Raw paper .....12 cs.
Transparent paper .....2 cs.
Photo paper .....4 cs.
Colored paper .....2 cs.
Tissue paper .....5 cs.
Writing paper .....1 cs.
Note paper and envelopes .....5 cs.
Stencil paper .....7 cs.
Shelf paper .....2 cs.
Gummed paper .....2 cs.
Card board .....38 rolls, 5 bls., 33 cs.
Miscellaneous paper .....256 rolls, 222 bls., 79 cs.

CIGARETTE PAPER

De Manduit Paper Corp., Collamer, St. Nazaire, 1450 cs.
American Tobacco Co., Collamer, Bordeaux, 342 cs.
American Tobacco Co., J. Cartier, Bordeaux, 100 cs.
Champagne Paper Corp., Paris, Havre, 6 cs.

WALL PAPER

Kensington Wallpaper Co., Missouri, London, 1 ble.
R. F. Downing & Co., American Trader, London, 5 pkgs.
R. F. Downing & Co., Olympic, Southampton, 4 cs.
Rohner Gehrig & Co., Bremen, Bremen, 1 cs.
F. A. Binder, A. Ballin, Hamburg, 5 bls.
Guaranty Trust Co., A. Ballin, Hamburg, 49 cs.
Globe Shipping Co., A. Ballin, Hamburg, 1 ble.
R. F. Downing & Co., A. Ballin, Hamburg, 1 ble.

PAPER HANGINGS

W. H. S. Lloyd & Co., American Trader, London, 5 bls.
A. C. Dodman, Jr., Inc., Cedric, Liverpool, 23 bls.

PAINTED PAPER

F. J. Emmerich, Paris, Havre, 16 cs.

NEWS PRINT

Jay Madden Corp., Carplaka, Hango, 291 rolls.
Jay Madden Corp., Donau, Bremen, 1169 rolls.
——, Stavangerfjord, Oslo, 602 rolls.
Perkins, Goodwin & Co., A. Ballin, Hamburg, 172 rolls.

PRINTING PAPER

E. Dietzgen & Co., Coahoma County, Rotterdam, 16 cs.

WRAPPING PAPER

F. C. Teipel & Co., Coahoma County, Rotterdam, 8 bls.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Cedric, Liverpool, 24 cs. (duplex).
L. A. Consmiller, Bremen, Bremen, 9 cs.
C. W. Sellers, Bremen, Bremen, 1 cs.
C. W. Sellers, A. Ballin, Hamburg, 26 cs.
Phoenix Shipping Co., A. Ballin, Hamburg, 2 cs.

FILTER PAPER

C. Schleicher Schull Co., Inc., A. Ballin, Hamburg, 16 cs., 2 bls.
H. Reeve Angel & Co., Inc., American Trader, London, 15 cs.
E. Fougena & Co., J. Cartier, Bordeaux, 46 cs.
G. Lueders, J. Cartier, Bordeaux, 2 bls.
G. Lueders, Paris, Havre, 2 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., American Trader, London, 3 cs.
——, Donau, Bremen, 13 crates, 4 cs.
Devoe & Reynolds Co., Olympic, Southampton, 3 cs.

COATED PAPER

W. A. Foster & Co., Missouri, London, 3 cs.
1st National Bank of Boston, Donau, Bremen, 3 cs.

BASIC PAPER

Globe Shipping Co., Donau, Bremen, 27 cs.
C. Bruning & Co., Coahoma County, Rotterdam, 51 rolls.

BARYTA COATED PAPER

Globe Shipping Co., Donau, Bremen, 75 cs.

METAL COATED PAPER

Globe Shipping Co., Donau, Bremen, 55 cs.
W. A. Kerner, A. Ballin, Hamburg, 5 cs.

ALUMINUM PAPER

Keller Dorian Paper Co., Donau, Bremen, 7 cs.

SURFACE COATED PAPER

International F'd'g Co., A. Ballin, Hamburg, 6 cs.

RAW PAPER

Agfa Ansco Corp., Bremen, Bremen, 12 cs.

TRANSPARENT PAPER

E. B. Baehr, Paris, Havre, 2 cs.

PHOTO PAPER

J. H. Schroeder Banking Corp., Bremen, Bremen, 4 cs.

COLORED PAPER

Tamm & Co., A. Ballin, Hamburg, 2 cs.

TISSUE PAPER

W. J. Byrnes, Olympic, Southampton, 2 cs.
F. C. Strype, Conte Grande, Genoa, 3 cs.

WRITING PAPER

F. B. Vandegrift & Co., Donau, Bremen, 1 cs.

NOTE PAPER AND ENVELOPES

J. Wanamaker, Cedric, Liverpool, 5 cs.

STENCIL PAPER

J. H. Schroeder Banking Corp., Bremen, Bremen, 7 cs.

SHELF PAPER

Manufacturers Trust Co., A. Ballin, Hamburg, 2 cs.

GUMMED PAPER

Heemsoth Basse & Co., A. Ballin, Hamburg, 2 cs.

CARD BOARD

R. Wilson Paper Corp., Coahoma County, Rotterdam, 5 bls.
F. C. Strype, Coahoma County, Rotterdam, 33 cs., 38 rolls.

MISCELLANEOUS PAPER

The Borregaard Co. Inc., Drottningholm, Gothenburg, 107 rolls, 104 bls.
H. Reeve Angel & Co., Inc., Drottningholm, Gothenburg, 149 rolls, 6 bls.
Kreamer & Co., Drottningholm, Gothenburg, 96 bls.
Japan Paper Co., Drottningholm, Gothenburg, 5 cs.
J. Wanamaker, Paris, Havre, 13 pkgs.
Standard Products Corp., Paris, Havre, 20 cs.
Cheramy Inc., Paris, Havre, 3 cs.
R. Hudnut, Inc., Paris, Havre, 3 cs.
Keller Dorian Paper Co., Paris, Havre, 10 cs.
P. C. Kuyper, Cedric, Liverpool, 1 cs.
Van Oppen & Co., Excalibur, Genoa, 21 cs.
A. Malaussena, Bremen, Bremen, 3 cs.
Quality Art Novelty Co., Coahoma County, Rotterdam, 16 bls.
Davies, Turner & Co., A. Ballin, Hamburg, 13 cs.

RAGS, BAGGINGS, ETC.

Darmstadt, Scott & Courtney, MacKeesport, Dunkirk, 64 bls. bagging.
New York Trust Co., MacKeesport, Dunkirk, 23 bls. rags.
W. Steck & Co., MacKeesport, Dunkirk, 32 bls. paper stock.
A. W. Fenton, Inc., Collamer, Bordeaux, 48 bls. rags.
H. G. Lichtenstein, Collamer, Bordeaux, 114 bls. rags.
Castle & Overton, Inc., Collamer, St. Nazaire, 51 bls. rags.
E. J. Keller Co., Inc., Collamer, ——, 179 bls. new rags; 65 bls. old rags.
——, Aarania, Southampton, 10 bls. rags.
——, J. Cartier, Havre, 329 bls. rags.
——, J. Cartier, Havre, 29 bls. bagging.
Guaranty Trust Co., J. Cartier, Havre, 411 bls. rags; 413 bls. bagging.
Chase National Bank, J. Cartier, Havre, 53 bls. rags.
International Trust Co., J. Cartier, Havre, 156 bls. bagging.
——, J. Cartier, Dunkirk, 170 bls. rags.
Castle & Overton, Inc., Cameronia, Glasgow, 43 bls. rags, 76 bls. bagging; 30 bls. carpets.
C. Nelson, Cameronia, Glasgow, 69 bls. rags.
M. Snedeker Corp., Cedric, Liverpool, 91 bls. thread waste.
J. Cohen Son Co., Cedric, Liverpool, 15 bls. rags.
E. J. Keller Co., Inc., Pipestone County, ——, 108 bls. flax waste.
E. Mayer, Pipestone County, Dunkirk, 21 bls. rags.
Castle & Overton, Inc., Morro Castle, Havana, 19 bls. rags.
Royal Manufacturing Co., Coahoma County, Rotterdam, 55 bls. thread waste.
Chemical National Bank, Coahoma County, Rotterdam, 82 bls. rags.
Amtorg Trading Cor., Coahoma County, Rotterdam, 1856 bls. rags.
Irving Trust Co., A. Ballin, Hamburg, 70 bls. threads.

OLD ROPE

W. Steck & Co., Drottningholm, Gothenburg, 68 coils.
Baring Bros. & Co., Cameronia, Glasgow, 63 coils.
Brown Bros., Harriman & Co., New York City, Bristol, 120 coils.
Brown Bros., Harriman & Co., Francisco, Newcastle, 127 coils.
W. Steck & Co., Coahoma County, Rotterdam, 81 coils.

CASEIN

——, A. Ballin, Hamburg, 40 bags.

WOOD PULP

M. Gottesman & Co. Inc., Carplaka, Stockholm, 600 bls. sulphite, 101 tons.
E. M. Sergeant & Co., Stavangerfjord, Oslo, 300 bls. wood pulp.
Perkins, Goodwin & Co., Drottningholm, Gothenburg, 118 bls. sulphite; 127 bls. sulphite.
E. M. Sergeant & Co., Drottningholm, Gothenburg, 375 bls. sulphite; 299 bls. kraft soda pulp.
Bulkley, Dunton & Co., Drottningholm, ——, 500 bls. wood pulp.
A. P. W. Paper Co., (Albany), Nidareid, Sheet Harbor, 8772 bls. wood pulp, 1963 tons.
Irving Trust Co., Minnequa, Hango, 307 bls. wood pulp 50 tons.
Lagerloef Trading Co., Hinnequa, Hango, 2 bls. sulphite.
Lagerloef Trading Co., Malaren, Helsingfors, 159 bls. mechanical pulp.
M. Gottesman & Co., Inc., Malaren, Halmstad, 2500 bls. sulphite.
Brown Bros., Harriman & Co., Hayre, Maru, Hamburg, 240 bls. wood pulp, 49 tons.

WOOD PULP BOARDS

Lagerloef Trading Co., Minnequa, Hango, 67 bls., 10 tons.

WOOD FLOUR

B. L. Soberski, Stavangerfjord, Frederickstad, 1500 bags.
A. Hurst & Co., Drottningholm, Gothenburg, 120 bags.
Innes, Speiden & Co., Drottningholm, Gothenburg, 726 bags.
Hoboken Trust Co., Coahoma County, Rotterdam, 200 bls., 10000 ks.

(Continued on page 84)

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
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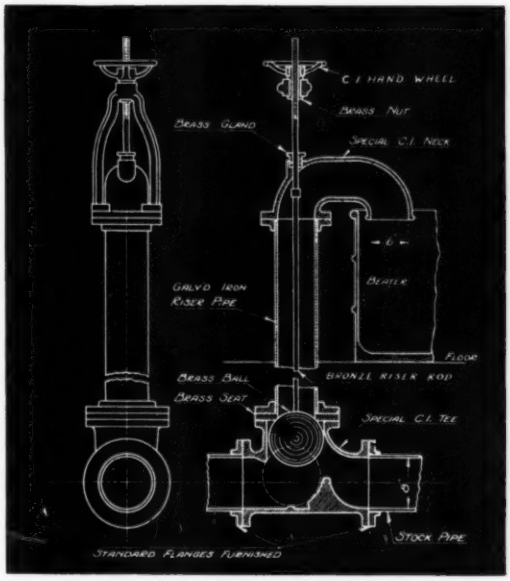

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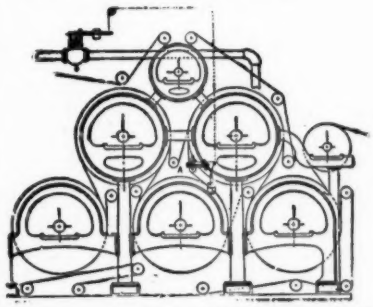

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will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES Buckland. Conn.

Imports of Paper and Paper Stock

(Continued from page 82)

B. L. Soberski, Coahoma County, Rotterdam, 3 bls.
State Chemical Co., Coahoma County, Rotterdam, 571 bags, 31140 ks.

PORTLAND, ME., IMPORTS

WEEK ENDING MARCH 14, 1931

Waterfalls Papermills Co., Carplaka, Gothenburg, 2500 bls. wood pulp.
H. Reeve Angel & Co., Inc., Carplaka, Hango, 55 rolls news print.
Lagerloef Trading Co., Carplaka, Hango, 3046 bls. sulphate, 509 tons; 3532 bls. sulphite, 645 tons.

NEWPORT NEWS IMPORTS

WEEK ENDING MARCH 14, 1931

Johaneson, Wales & Sparre, Inc., Malaren, Gothenburg, 1421 bls. kraft soda pulp.

BOSTON IMPORTS

WEEK ENDING MARCH 14, 1931

J. Andersen & Co., Carplaka, Gothenburg, 2750 bls. sulphite.
Perkins, Goodwin & Co., Carplaka, Gothenburg, 889 bls. sulphite.
Parsons & Whittemore, Inc., Carplaka, Gothenburg, 240 bls. sulphite.
E. M. Sergeant & Co., Carplaka, Gothenburg, 250 bls. wood pulp.
J. Andersen & Co., Carplaka, Stockholm, 300 bls. wood pulp, 50 tons.
Stone & Downer, Carplaka, Hango, 42 rolls news print.
National Shawmut Bank, Missouri, London, 177 bls. rags.
Brown Bros., Harriman & Co., Missouri, London, 131 coils old rope.
E. Mayer, Pipeston County, Dunkirk, 59 bls. rags.
Chase National Bank, Pipestone County, Dunkirk, 75 bls. rags.
E. Butterworth & Co., Inc., Pipestone County, Dunkirk,k 68 bls. flax waste.
J. H. Wilelock, Pipestone County, Dunkirk, 47 bls. thread waste.
Draper & Co., Pipestone County, Dunkirk, 20 bls. thread waste.
National Shawmut Bank, Pipestone County, Dunkirk, 17 bls. rags.
Brown Bros., Harriman & Co., Francisco, Hull, 194 coils old rope.

PHILADELPHIA IMPORTS

WEEK ENDING MARCH 14, 1931

J. A. Steer & Co., Collamer, Bordeaux, 30 bls. rags.
Castle & Overton, Inc., Collamer, Bordeaux, 47 bls. rags.
H. G. Lichtenstein, Collamer, Bordeaux, 96 bls. rags.
Robert Blank, Collamer, Bordeaux, 104 bls. rags.
A. Hurst & Co., Collamer, St. Nazaire, 22 bls. rags.
Guaranty Trust Co., J. Cartier, Havre, 87 bls. rags.
W. L. Jones & Co., J. Cartier, Havre, 3 cs. hanging paper.
——, J. Cartier, Havre, 191 bls. rags.
E. J. Keller Co., Inc., J. Cartier, ——, 58 bls. rags.
J. W. Hampton, Jr. & Co., Inc., Minnequa, Hango, 51 rolls news print.
Paper Manufacturers Co., Inc., Minnequa, Hango, 134 rolls news print.
Lagerloef Trading Co., Minnequa, Hango, 20577 bls. sulphite, 3722 tons; 788 bls. sulphate, 157 tons.
Brown Bros., Harriman & Co., New York City, Bristol, 117 coils old rope.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 600 bls. sulphite.
Perkins, Goodwin & Co., Malaren, Gothenburg, 1785 bls. wood pulp.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 897 bls. mechanical pulp.

BALTIMORE IMPORTS

WEEK ENDING MARCH 14, 1931

S. Shapira & Co., MacKeesport, Dunkirk, 96 bls. rags.
Perkins, Goodwin & Co., Malaren, Gothenburg, 2540 bls. kraft pulp; 127 bls. sulphate.
Price & Pierce, Ltd., Malaren, Gothenburg, 1000 bls. sulphite.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 183 bls. sulphite.
E. M. Sergeant & Co., Malaren, Gothenburg, 1196 bls. sulphite.
Johaneson, Wales & Sparre, Inc., Malaren, Gothenburg, 748 bls. kraft soda pulp.
M. Gottesman & Co., Inc., Malaren, Halmstad, 2400 bls. sulphite.

NORFOLK IMPORTS

WEEK ENDING MARCH 14, 1931

W. M. Stone & Co., Minnequa, Hango, 292 rolls news print.
Lagerloef Trading Co., Minnequa, Hango, 440 rolls wood pulp boards; 3053 bls. sulphate, 556 tons; 7850 bls. sulphite, 1442 tons.

Arizona To Keep Record on Rag Papers

The state of Arizona has just passed a law which provides that all public records must be kept on 100 per cent rag papers. So far as is known this is the first state in the union ever to make such a provision. The act reads as follows:—

Relating to Quality of Paper to be used for Making Public Records of the State of Arizona or any County, City, Town or other Political Subdivision and Repealing all Act and Parts of Acts in Conflict Therewith.

Be it Enacted by the Legislature of the State of Arizona:

Section 1. All permanent public records of the State of Arizona or of any County, City, Town or other political subdivision of the State of Arizona, that are made after the first day of July, 1931, shall be kept on paper which conforms to the following specifications as to texture: (1) Grade number one, ledger paper, the rag content of which shall be 100 per cent new rags, white, cream or unbleached; (2) grade number one bond paper, the rag content of which shall be 100 per cent new rags.

Section 2. Any public officer charged with the duty of keeping or making such public records who shall violate the provisions of this act shall be guilty of a misdemeanor.

Section 3. All acts and parts of acts in conflict with this act are hereby repealed.

Boston Paper Market More Buoyant

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 16, 1931.—The present month in the paper business here appears to be somewhat more active so far than the corresponding period in February. At least a moderate volume of paper has moved during the week. A better feeling prevails in the trade. More merchants say the market is "good" or "fairly good" rather than just "fair," although in some cases trade is spasmodic. The spasmodic movement is upward rather than downward. According to reports, the situation in fine paper is possibly a bit more favorable than that in wrapping paper, although kraft is fair, and the outlook seems good. Sales are not made without effort, however, and a dealer in discussing business, says, "you have to go out and hunt for it." As a rule, orders are small.

The box board market as a whole is firm, but spotty, with an average amount of sales. At one office the statement is made that the market is a shade better and at another that it is not even fair. It is felt that the general box board situation would be better if prices were higher. There is an improved sentiment in paper specialties, although the market is somewhat spotty.

In some quarters of the paper stock market trade is reported better, especially in waste papers. A few orders are being placed for ledger stock and book stock and at the same time there are more inquiries for these materials. Bagging is unchanged. Values remain the same. A dealer in paper stock, in talking over conditions, referred to the prediction made some time ago that the small mills, or those having the least overhead expense, would come into their own and get ahead, adding that the prediction is now being realized.

The twine situation is apparently a little better, although some mills have been down to a rather low point, almost to going out of business, according to reports. A disturbing factor in the trade is what is regarded as unfair competition from prison made goods.

Norwegian Mills on Short Schedules

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 18, 1931.—Few Norwegian paper and pulp mills are operating at full schedules, according to a report from Commercial Attache M. H. Lund, at Oslo, who cites the stocks accumulated in anticipation of a revival in demand as one reason for the curtailment in output. Another is the international agreement to curtail sulphite production by 15 per cent. Members of the industry are rather pessimistic as to the outlook for the first half of this year, but hope for a definite improvement during the second half of the year, when the full effect of such measures as have been taken to stabilize the market will be felt.

QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

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The Use of

ELIXMAN CORES

protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

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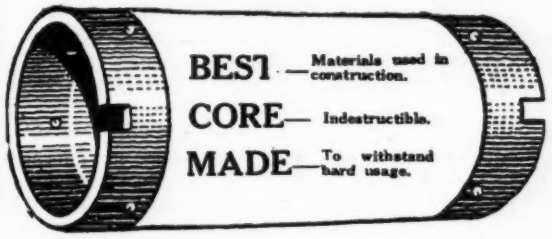

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MACHINE FINISHED BOOK
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New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, March 18, 1931

Trading in the local paper market was fairly active during the past week. Most of the various standard grades of paper were in seasonal request. Supplies continue to move into consumption in a fairly satisfactory manner. Sales forces of the leading paper houses are conducting a strenuous campaign for new business. Prices are steady on some grades and irregular on others.

News print production was maintained at 58 per cent of rated capacity during the past week, according to information gathered by the News Print Service Bureau. Shipments are going forward at 61 per cent of rating. Stocks at United States and Canadian mills totalled 75,886 tons at the end of February, which was equivalent to 4.2 days average output.

Conditions in the paper board market were little changed. Box board production is being maintained in sufficient capacity to take care of current requirements. Prices remain unchanged. The fine paper market is in a sound position, with prices holding to schedule, in most instances. The coarse paper market is irregular, although wrapping paper is moving in fairly good volume.

Mechanical Pulp

While the ground wood market was rather quiet, the industry continues in a sound statistical position. Offerings of both domestic and imported mechanical pulp are not excessive, due to recent curtailment of production at home and abroad. Inquiries for future needs are fairly numerous. Prices on the various grades are generally holding to previously quoted levels.

Chemical Pulp

The position of the chemical pulp market is practically unchanged. Demand for both imported and domestic grades is fairly satisfactory. Supplies are going forward to the paper mills in normal volume for the season. No radical price changes have been reported of late and the outlook for the future is considered more promising, in some quarters.

Old Rope and Bagging

Business in the old rope market is rather dull. Both domestic and foreign old manila rope are only moderately active. Small mixed rope is moving in fair volume. Old rope prices are somewhat easier. The bagging market is displaying a steady trend. Roofing bagging is in better demand. Gunny and scrap are holding up well. Prices remain unchanged.

Rags

The domestic rag market was quiet during the past week, although cotton cuttings were in slightly better demand. Roofing rags continue in seasonal request. Trading in mixed rags is light. Quotations on domestic rags remain unchanged, in most instances. The imported rag market was dull, with the exception of roofing grades, which are arousing more interest.

Waste Paper

Mill interest in the paper stock market is more encouraging. Book stock is in good demand and, as offerings are not excessive, prices rule steady to firm. Hard white and soft white shavings continue steady. The lower grades are also showing signs of improvement, especially strictly folded news and No. 1 mixed paper, which are in better demand than for some time past.

Twine

Seasonal conditions prevail in the local twine market. Most of the business transacted during the past week was along routine lines. Demand for the various grades should be fairly heavy from now on to the Easter holidays, at least.

Prices are generally holding to previously recorded levels, despite reports that shading of prices were made on some extra desirable orders.

C. Howard Smith Dead

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 16, 1931.—C. Howard Smith, former president of the Howard Smith Paper Mills, Ltd., died here today from a heart attack while dressing. He was 58 years of age. He was a native of St. John's, Que., and commenced his business career with the Canada Paper Company, with whom he stayed for a year. He was afterwards manager of the Kinleith Paper Mills.

He then began business for himself as a paper jobber and represented Alexander Bunting & Co., and Ritchie and Ramsay, Ltd.

In 1912, Mr. Smith founded the Howard Smith Paper Company, and built his first mill at Beauharnois for the manufacture of high-grade paper. His business extended rapidly and in 1916 it was found necessary to buy a mill at Crabtree Mills, Que.,

In 1919, Mr. Smith became president of the Toronto Paper Company, Cornwall, Ont., after purchasing all the shares of the company. He added four machines and one pulp mill to the productive capacity of his firm. In addition to being president of these two companies Mr. Smith was also president of the Canada Paper Company, Ltd., the Alliance Paper Mills, Ltd, Merriton, Ont.; Georgetown Coated Paper Mills, Ltd.; Ritchie & Ramsey, Ltd., and he was also interested in the Lincoln Pulp & Paper Mills, Ltd.

He was also a director of the Federal Paper Company, Ltd., Montreal, and of the Canada Power and Paper Company.

Mr. Smith was elected president of the Canadian Pulp and Paper Association in 1917. During the session of 1919-1920 he was chairman of the Quebec Division of the Canadian Manufacturers Association and president of the Canadian association in 1923-24.

He retired from the presidency of his own company at the beginning of this year and for some time had been troubled with heart attacks.

Mr. Smith is survived by his wife, formerly Miss Alice Young Day, by one son, Edgar M. Smith, by three brothers, Edgar M., W. W., of New York, and Gerald, and two sisters, Miss Charlotte Smith, and Mrs. Cartner, both of Kingston, Ont., and two grandchildren.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

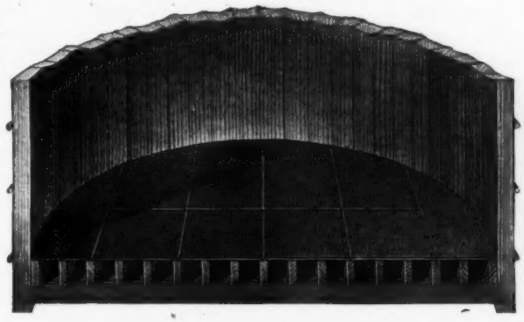
DRAPER BROS. COMPANY

CANTON, MASS.

Woolen manufacturers since 1856

Perforated Metal Drainer Bottoms

Made of Chrome Nickel Iron Sheets for use in blow pits, come nearer to solving one of the most troublesome problems in the Sulphite Mills, both from the standpoint of waste and upkeep than any other material introduced to date.



Typical Installation of Perforated Blow Pit Drainer Bottom

This Alloy Metal is non-corrosive, and is fastened securely to your present wood joist. The sheets, perforated with 3/32" round holes, ½" centers, give fast drainage, will not clog, saves fibre loss and replaces the old style wood or tile costly drainer blocks. Advise size of tanks and we will submit further details.

NORTMANN-DUFFKE CO.

Milwaukee, Wis.

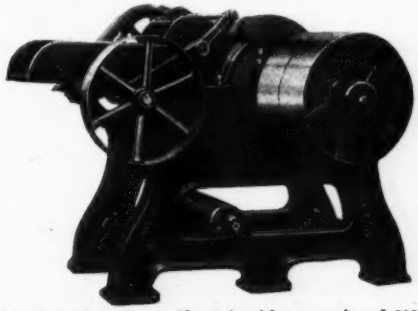
SPEED

AND SURE PERFORMANCE in cutting RAGS, BURLAP, BAGGING, ROPE

TAYLOR, STILES & COMPANY GIANT REG. U.S. PAT. OFF. RIEGELSVILLE, N.J. U.S.A.

if your plant is equipped with RAG CUTTERS

the standard of the world for 60 years



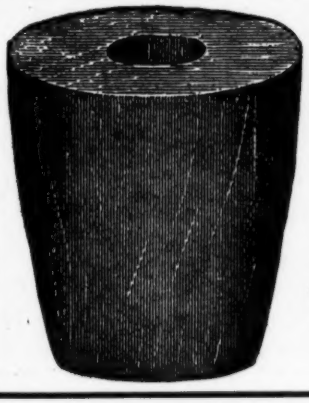
This is the Giant Cutter No. 2-A with a capacity of 3000 lbs. per hour. A strong, heavy machine designed for cutting thread waste, jute butts, burlap, gunny bagging, magazines, catalogs, old papers and all grades of rags.

GIANT RAG CUTTERS HAVE CAPACITIES RANGING FROM 1 ton to 5 tons per hour.

TAYLOR, STILES & COMPANY

Riegelsville, N. J.

CANADIAN REPRESENTATIVES
Waterous Limited, Brantford, Ont., Canada
SOLE AGENTS FOR EUROPE
R. J. Marx, 133-39 Finsbury Pavement, London, E. C.



PAPER ROLL PLUGS

Any quantity
10,000,000 Yearly
Capacity

Wood Products Co.
INC.
Brewer, Maine

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL.
Wednesday, March 18, 1931.

BLANC FIXE.—Conditions in the blanc fixe market are practically unchanged. The contract movement is well up to average. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels at works.

BLEACHING POWDER.—The bleaching powder market is displaying a steady trend. Shipments against contract are going forward in good volume for the time of year. Prices are holding to formerly quoted levels. Bleaching powder is selling at from $2.00 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—Demand for casein was rather quiet. Prices remain unchanged. Domestic standard ground is quoted at 8½ cents and finely ground at 11½ cents per pound. Argentine standard ground is selling at 10 cents and finely ground at 11 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—The caustic soda market was moderately active. Contract shipments are going forward to the paper mills at a steady pace. Solid caustic soda is quoted at from $2.50 to $2.55, while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—Trading in the china clay market continued fairly active. The contract movement was about normal for the season. Prices are holding to schedule. Imported china clay is quoted at from $13 to $21 per ton, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—Steadiness prevailed in the chlorine market during the past week. Shipments against contract are going forward in good volume. Prices are being maintained at recently quoted levels. Chlorine is selling at $2.50 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market was firmer and prices advanced sharply. The grades of gum rosin used in the paper mills are now quoted at from $5.70 to $6.00 per 280 pounds, in barrels, at yards. Wood rosin is selling at $4.40 per 280 pounds, in car lots, at southern shipping points.

SALT CAKE.—Offerings of salt cake are about sufficient to take care of current requirements. The prevailing demand is fairly satisfactory. Salt cake is quoted at from $16 to $17; German salt cake at from $15.50 to $16.00; and chrome salt cake at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—The position of the soda ash market was little changed. Contract shipments are going to the paper mills at a steady pace. Prices remain unaltered. Contract quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.15; and in barrels, $1.38.

STARCH.—Most of the business transacted in the starch market was along routine lines. The contract movement is fairly satisfactory for the time of year. No further price changes have been reported. Special paper making starch is quoted at $2.67, in bags; and at $2.94 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—The sulphate of alumina market is exhibiting a strong undertone. Shipments against contract are moving in good volume. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.40; iron free is selling at $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Business in the sulphur market continues fairly active. Sulphur is still quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—The talc market was rather quiet during the past week. Demand from the paper mills was irregular. Prices are holding to schedule, however, without difficulty. Domestic talc is quoted at from $16 to $18 per ton, in bulk; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper
(F. o. b. Mill)

Ledgers	11.00	@	38.00
Bonds	6.75	@	53.25
Writings—			
Extra Superfine	14.00	@	32.00
Superfine	14.00	@	32.00
Tub sized	10.00	@	15.00
Engine sized	6.75	@	11.00
Book, Cased—			
S. & S. C.	5.50	@	—
M. F.	5.25	@	—
Coated and Enamel	7.00	@	10.50
Lithograph	7.50	@	12.00
Tissues—Per Ream—			
White No. 1	.65	@	.67½
Anti-Tarnish M G only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.57½
Kraft	.65	@	.70
Manila	.55	@	.57½
Kraft—			
No. 1 Domestic	4.25	@	5.30
No. 2 Domestic	3.00	@	3.75
Southern	3.00	@	3.75
Imported	6.00	@	7.00
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¼	@	—
No. 2	.11¼	@	—
Bleached, basis 20 lbs.	.11¼	@	—
(Delivered New York)			
News, per ton—			
Rolls, contract	62.00	@	—
Rolls, spot	62.00	@	—
Sheets	67.00	@	—
Side Runs	47.00	@	52.00
Boards—per ton—			
News	32.50	@	35.00
Straw	40.00	@	45.00
Chip	30.00	@	32.00
Binders' Boards	65.00	@	70.00
Standard 85 Test Liner	35.00	@	40.00
Sgl. Mla. Lt. Chip. (F. o. b. Mill)	42.50	@	—
Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp
(On Dock)

No. 1 Imported—			
Moist	28.00	@	32.00
Dry	30.00	@	34.00
(F. o. b. Mill)			
No. 1 Domestic	28.00	@	34.00

Chemical Pulp
(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.80	@	4.25
Easy Bleaching	2.35	@	2.60
No. 1 strong unbleached	2.00	@	2.35
Mitscherlich unbleached	2.10	@	2.70
No. 2 strong unbleached	1.90	@	2.00
No. 1 Kraft	1.40	@	1.75
No. 2 Kraft	1.35	@	1.55
Sulphate—			
Bleached	3.00	@	3.50
(F. o. b. Pulp Mill)			
Sulphite (Domestic)—			
Bleached	2.40	@	4.75
Easy Bleaching Sulphite	2.55	@	2.75
News Sulphite	2.35	@	2.60
Mitscherlich	2.50	@	3.25
Kraft (Domestic)	1.60	@	2.75
Delivered Paper Mills)			
Soda Bleached	3.00	@	—

Domestic Rags
New Rags
(Prices to Mill f. o. b N. Y.)

Shirt Cuttings—			
New White, No. 1	8.00	@	8.50
New White, No. 2	7.00	@	7.25
Silesias No. 1	6.00	@	6.50
New Unbleached	8.00	@	8.50
New Blue Prints	5.00	@	5.50
New Soft Blacks	4.00	@	4.30
Blue Overall	6.00	@	6.25
Washables	3.75	@	4.00
Fancy	4.00	@	4.50
Mixed Khaki Cuttings	4.25	@	5.25
Pink Corset Cuttings	6.50	@	7.00
O. D. Khaki Cuttings	5.15	@	5.75
Men's Corduroy	3.00	@	3.50
New Mixed Blacks	3.00	@	3.25
Old Rags			
White, No. 1—			
Repacked	5.25	@	5.75
Miscellaneous	4.25	@	4.75
White, No. 2—			
Repacked	3.00	@	3.50
Miscellaneous	2.30	@	2.50
St. Soiled, White	1.50	@	1.75
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.65	@	1.85
Black Stockings	3.25	@	3.75
Roofing Rags—			
Cloth Strippings	1.25	@	1.30
No. 1	1.25	@	1.30
No. 2	.90	@	1.00
No. 3	.70	@	.80
No. 4	.65	@	.70
No. 5A	.50	@	.60

Foreign Rags
New Rags

New Dark Cuttings	2.15	@	2.40
New Mixed Cuttings	2.25	@	2.50
New Light Silesias	5.75	@	6.25
Light Flannelettes	6.25	@	6.75
Unbleached Cuttings	7.50	@	8.00
New White Cuttings	7.25	@	7.75
New Light Oxfords	5.75	@	6.25
New Light Prints	4.25	@	4.75
Old Rags			
No. 1 White Linens	7.00	@	7.50
No. 2 White Linens	5.50	@	6.00
No. 3 White Linens	4.00	@	4.50
No. 4 White Linens	2.50	@	3.00
No. 1 White Cotton	5.00	@	5.50
No. 2 White Cotton	4.00	@	4.50
No. 3 White Cotton	2.75	@	3.75
No. 4 White Cotton	1.60	@	1.75
Extra Light Prints	2.50	@	2.75
Ord. Light Prints	2.10	@	2.25
Med. Light Prints	1.65	@	1.75
Dutch Blue Cottons	1.90	@	2.10
French Blue Linens	2.65	@	2.75
German Blue Linens	2.25	@	2.40
German Blue Cottons	1.75	@	1.85
Checks and Blues	1.60	@	1.75
Lindsay Garments	1.10	@	1.20
Dark Cottons	.80	@	.90
Old Shopperies	.75	@	.80
New Shopperies	.75	@	.80
French Blues	1.80	@	1.96

Old Rope and Bagging
(Prices to Mill f. o. b. N. Y.)

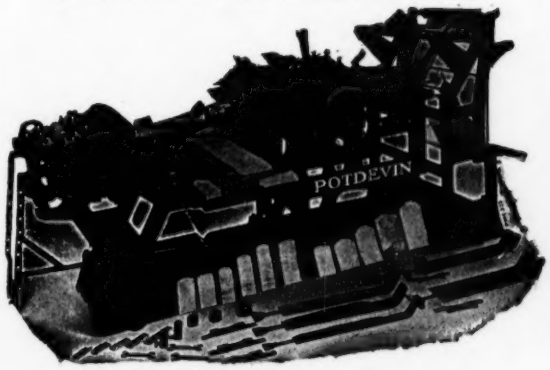
Gunny No. 1—			
Foreign	1.65	@	1.80
Domestic	1.65	@	1.80
Wool Tares, light	1.30	@	1.40
Wool Tares, heavy	1.35	@	1.40
Bright Bagging	1.30	@	1.35
Small Mixed Rope	.90	@	1.00
Manila Rope—			
Foreign	2.05	@	2.25
Domestic	2.20	@	2.25
New Burlap Cut	2.25	@	2.50
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers
(F. o. b. New York)

Shavings—			
Hard, white, No. 1	2.75	@	2.85
Hard White, No. 2	2.30	@	2.40
Soft, white, No. 1	2.50	@	2.60
White envelope cuttings	2.95	@	3.05
Flat Stock—			
Stitchless	.90	@	1.00
Overissue Mag.	.90	@	1.00
Solid Flat Book	.75	@	.85
Crumpled No. 1	.60	@	.70
Solid Book Ledger	1.90	@	2.00
Ledger Stock	.80	@	.90
New B. B. Chips	.20	@	.30
Manilas—			
New Env. Cut	2.00	@	2.20
New Cuttings	1.50	@	1.65
Extra No. 1 old	1.25	@	1.35
Print	.50	@	.60
Bogus Wrapper	.50	@	.60
Container	.25	@	.30
Old Kraft Machine—			
Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.70	@	1.80
Strictly Overissue	.40	@	.45
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.20
Common Paper			Nominal

NEW **POTDEVIN** PRINTING

SPECIALTY BAG MACHINERY



(Model 290) 2-Color Printing Flat and Square

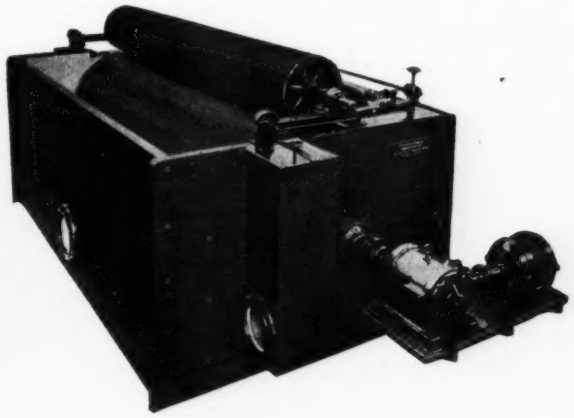
40 Other Models

PAPER BAG MACHINERY

POTDEVIN MACHINE CO.

1223 38th Street, Dept. 4, Brooklyn, N. Y., U. S. A.
Phones: Windsor 1700-1701-1702

The Glens Falls Decker



MODERN DESIGN
SUBSTANTIAL CONSTRUCTION
PERFECT CONTROL

BUILT IN SIZES 36" x 72" to 48" x 132"

GLENS FALLS MACHINE WORKS
GLENS FALLS, N. Y.

H—T BRAND

COATING AND FILLING

The Clay of Uniformity

AMERICAN MADE
FOR
AMERICAN TRADE

Edgar Clays are the result of more than fifty years experience in washing clay—used by leading paper mills.

also manufacturers of

KLONDYKE BRAND
FILLER CLAYS

EDGAR BROS. CO.
50 CHURCH ST., NEW YORK

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.32	@	.34
No. 1	.22	@	.24
No. 2	.21	@	.22
No. 3	.19	@	.20
A. Italian, 18 basis	.38	@	.39
Finished Jute—			
Dark 18 basis	.20½	@	.21
Light 18 basis	.22½	@	—
Jute Wrapping, 3-6 Ply—			
No. 1	.14¼	@	—
No. 2	.13¼	@	—
Tube Rope—			
4-ply and larger	.10¼	@	—
Fine Tube Rope—			
4-ply	.12¼	@	—
3-ply	.13¼	@	—
2-ply	.14¼	@	—
Paper Makers Twine			
Balls	.08¼	@	—
Box Twine, 2-3 ply	.09	@	.10
Jute Rope	.11	@	.12
Amer. Hemp, 6	.29	@	.31
Java Sisal			
No. 1 Basis	.12	@	—
No. 2 Basis	.11¼	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Twine	.22½	@	.24½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05½	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	—	@	—
No. 1 Soft Shavings	2.10	@	2.15
Ledger & Writings	.70	@	.75
Solid Books	.75	@	.80
Blanks	1.60	@	1.65
Krafts	1.25	@	1.35
New Kraft Cuts	1.35	@	1.45
Manila Env. Cuts	1.50	@	1.55
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.28	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.08	@	.40
Writings—			
Superfine	.12½	@	.18
Extra fine	.18	@	.22
Fine	.17	@	.26
Fine, No. 2	.15	@	.25
Fine, No. 3	.09	@	.20
Book, M. F.	.05	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.09	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03½	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¼	@	.04
Southern Kraft No. 1	—	@	.03¼
Southern Kraft No. 2	—	@	.03½
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	62.00	@	—
Straw Board	52.50	@	70.00
News Board	32.50	@	—
Chip Board	30.00	@	—
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00	@	—
No. 2, per ton	70.00	@	—
Carload lots	68.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill. f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.07	@	.08
New White, No. 2	.06	@	.06½
Light Silesias	.05½	@	.06
Silesias, No. 1	.07	@	.09
Black Silesias, soft	.05	@	—
New Unbleached	.07½	@	.08
Washable, No. 1	.03½	@	.04
Blue Overall	.06	@	—
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.02½	@	.03
Fancy	.04	@	—
New Black Soft	.04	@	.05
New Light Seconds	.02	@	.02½
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05	@	—
No. 2 Mixed	.04	@	.04¼
Corduroy	.02½	@	.03
New Canvas	.07½	@	.08
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	3.00	@	3.50
M. G.	5.00	@	—
Thirds and Blues—			
Miscellaneous	1.50	@	1.75
Repacked	2.00	@	2.25
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.75	@	3.00
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.65	@	2.75
No. 2 Hard White	2.30	@	2.50
No. 1 Soft White	2.25	@	2.50
No. 2 Soft White	1.40	@	1.60
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.60	@	.70
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.05	@	1.25
No. 1 Books, heavy	1.00	@	1.15
No. 2 Books, light	.90	@	.95
No. 1 New Manila	2.15	@	2.30
No. 1 Old Manila	1.50	@	1.60
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.30	@	1.35
Common Paper	.25	@	.35
No. 1 Mixed Paper	.25	@	.30
Straw Board, Chip	.35	@	.40
Binders Board, Chip	.35	@	.45
Corrugated Board	.50	@	.60
Overissue News	.40	@	.45
Old Newspaper	.25	@	.30

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09¼	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05½
No. 2 Kraft	0.3½	@	.04¼
(F. o b. Boston)			
Southern Kraft	.03¼	@	.03½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
Delivered New England points			
News Print, rolls	61.50	@	—
Straw Board, rolls	.009	—	@52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	32.50	@	—
Chip Board	30.00	@	—
Chip Board (Creasing)	32.50	@	—
Single Manila Lined Chip	45.00	@	—
Single White, Patent Coated News Board Bender, No. 1	60.00	@	75.00
Single White, Patent Coated News Board Bender, No. 2	55.00	@	65.00
Wood Pulp Board	75.00	@	80.00
Binder Boards	67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	—	@	2.40
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.60	@	.65
Solid Ledger Stock	—	@	1.75
No. 1 Books, heavy	.75	@	.80
No. 1 Books, light	—	@	.65
Crumpled Stitchless Book Stock	—	@	.70
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	—	@	1.10
Manila	.80	@	.90
No. 1 Mixed Paper	—	@	.16
Overissue News	—	@	.40
Old Newspapers	.25	@	.30
Box Board, Chip	.16	@	.20
Corrugated Boxes	.35	@	.40

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.80
Domestic	1.60	@	—
Manila Rope—			
Foreign	2.25	@	—
Domestic	2.50	@	—
Transmission Rope	1.75	@	—
Mixed Strings	—	@	.70
Jute Rope	—	@	1.05
Jute Carpet Threads	.90	@	1.05
Bleachery Burlap	—	@	3.25
No. 1 Scrap Burlap	—	@	1.25
Scrap Sisal	1.35	@	1.40
Scrap Sisal for shredding	—	@	1.50
Wool Tares, heavy	1.30	@	—
New Burlap Cutting	1.75	@	2.00
Australian Pouches	2.50	@	—
Heavy Baling Bagging	—	@	1.75
Paper Mill Bagging	—	@	.85
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.06½	@	.07
New White No. 2	—	@	.06
Silesias No. 1	.06	@	.06¼
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	.75	@	.80
No. 2	.65	@	.70
No. 3	.50	@	.60
No. 4	—	@	.60

Foreign Rags
(F. o. b. Boston)

Dark Cottons	—	@	.75
New No. 1 White Shirt Cuttings	7.25	@	7.50
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.65	@	1.75
Old Linsey Garments	.85	@	.95

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.09¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.09½	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.12½	@	7.60
No. 2 M. F. (carloads)	6.90	@	7.35
No. 3 M. F. (carloads)	6.65	@	7.15
No. 1 S. C. (carloads)	7.60	@	8.10
No. 2 S. C. (carloads)	7.35	@	7.85
No. 3 S. C. (carloads)	7.12½	@	7.60
No. 4 S. C. (carloads)	5.95	@	6.40
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft No. 2	5.40	@	—
(Delivered Toronto)			
News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	70.00	@	—
Sulphite, bleached	72.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.80	@	—
Soft White	2.60	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.10	@	—
Light and Crumpled Book Stock	1.20	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.80	@	—
Kraft	1.90	@	—
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.06
Fancy Shirt Cuttings	.06	@	.06¾

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PAPER TRADE JOURNAL

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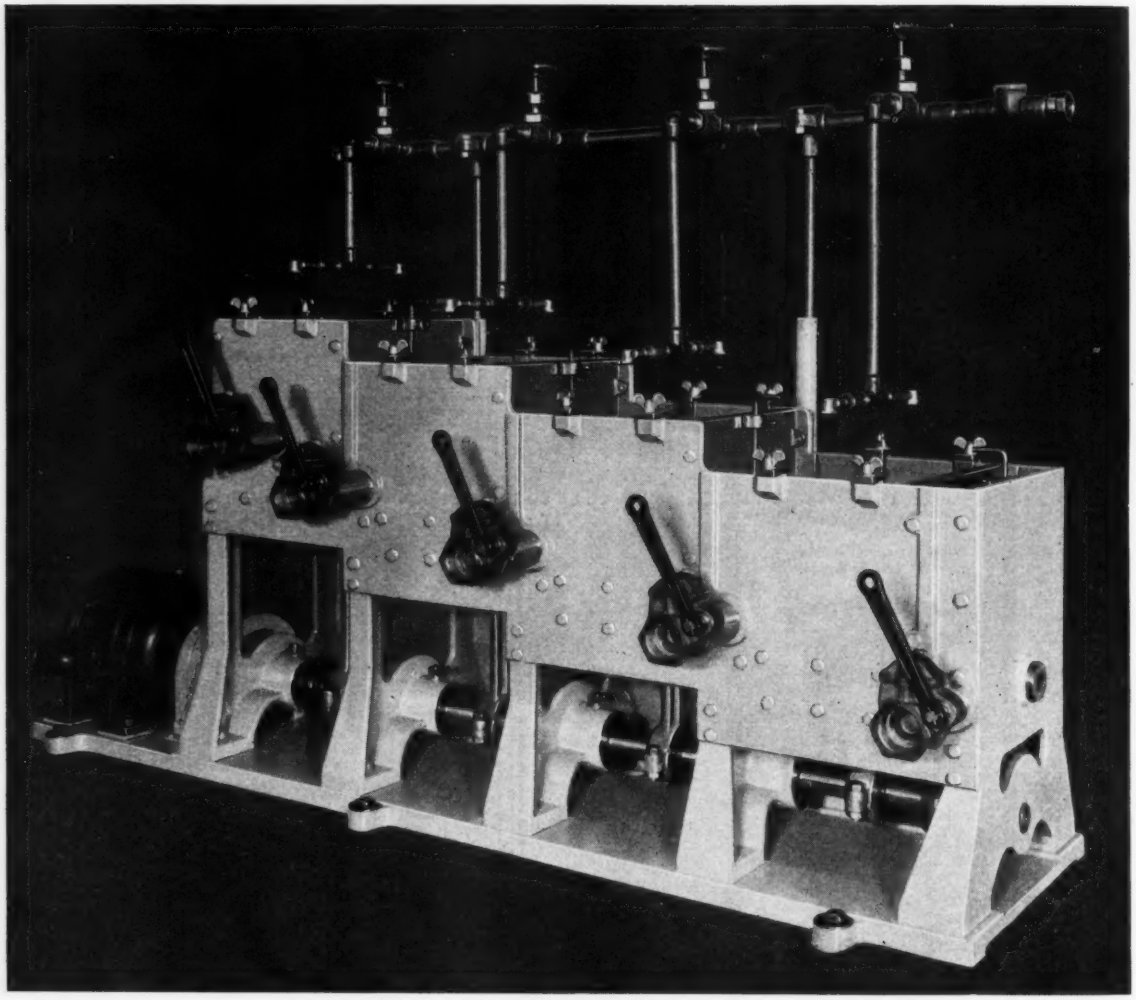
A Positive—Accurate—Rapid Test of Ground-wood and Chemical Pulp Characteristics and Quality



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